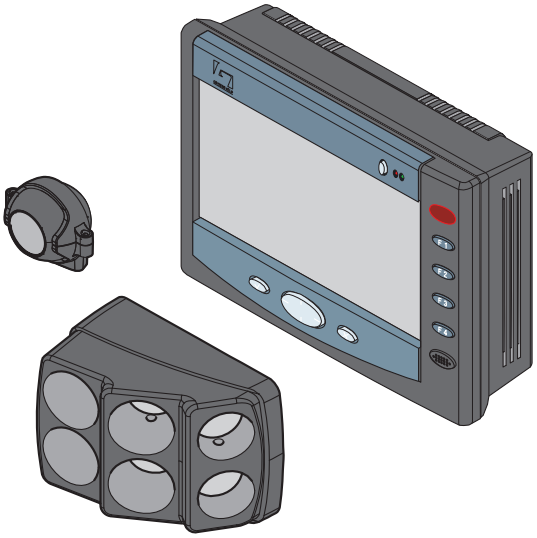
General Installation Manual



Greensight/Greencam

EF2001P01

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General information

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This manual applies to the standard version of the product. Groeneveld cannot accept liability for any damage arising from the use of specifications other than that supplied.

You are requested to contact Groeneveld technical service for information concerning adjustment, maintenance work or repairs that is not described in this manual.

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Preface

This general installation manual contains a description of the Greensight and Greencam system. It is intended to explain the working principle of the system, and its possibilities.

The following pictogram is used in this manual to alert or warn the user:

ATTENTION
Draws the user's attention to important additional information, intended to help prevent problems.

WARNING
Warns the user when bodily injury or serious damage to the equipment can be caused by failure to follow the instructions provided.

Use of symbols

Symbol	*Explanation*
M6/2	Connector M6 / pin 2 to Monitor
C1/1	Connector C1 / pin 1 to Camera
P1/1	Connector P1 (female) / pin 1
R1/1	Connector R1 (male) / pin 1
TS1/1	Connector TS1 / pin 1 to Top/Side sensor
BS1/1	Connector BS1 / pin 1 to Bottom Sensor
U8/2	Connector U8 / pin 2 to Control Unit
N1/1	Connector N1 / pin 1 to Navigation
BE	Beige
BK	Black
BN	Brown
BU	Blue
GN	Green
GY	Grey
LB	Light Blue
LG	Light Green
OR	Orange
PK	Pink
RD	Red
YE	Yellow
VT	Violet
WH	White
GC	Greencam
GS	Greensight (applicable to GS2 and GS3)
VP	Video Processor

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1. General

The Greensight/Greencam active camera detection system by Groeneveld is a simple and effective system to enable vehicles to be reversed more safely and with less damage, when the driver's view of the reversing zone is obscured. Greensight detects persons and objects present within a certain distance behind the vehicle. By integrating a camera into the existing product concept, Groeneveld has succeeded in bringing an active and a passive system together in a compact and effective reversing safety system. Moreover, Groeneveld offers the option of extending the system with a side view or front view camera that meets all EU requirements inclusive 2005/27/EC regulation.

For correct operation and responsible use of the system, it is of critical importance that the system is correctly installed, and that the user is fully familiar with the operation and the limitations of the system, as described in the accompanying user manual.

ATTENTION
The user's manual must always be on hand in the driver's cab.

In particular, installation of the control unit, sensor and camera must be carried out with great care to avoid damage to these sensitive components.

The installation instructions in this manual give special attention to the correct way to install the various components in the vehicle. Points that deserve special attention are emphasised and clarified using illustrations. If you do not have sufficient technical skill and know-how to mount and connect the components in the vehicle, then you should have the Greensight/Greencam system installed by a specialist.
Groeneveld has the required skills in house and will be pleased to help you install the Greensight/ Greencam active camera detection system.

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2. General installation

Before installation, first determine the best position for the components.

When installing, always ensure that:

- the vehicle handbrake is engaged;
- the vehicle ignition switch is off, and the key is removed;
- the various components are installed in locations that at all times are accessible for service and repair activity.

The recommended mounting position will be described for all the components shown.

ATTENTION
Correct operation of the Greensight could be negatively influenced by extensions to the bodywork of the vehicle after installation of the Greensight. In such an event, please contact Groeneveld or your dealer for advice on the best solution.

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2.1 System configurations

Several combinations with Greensight and/or Greencam are possible. In this paragraph the most common system configurations are shown.

Version	*Page*	*Control unit*	*Monitor*	*Monitor with navigation*	*Display*	*Sensors*		*External lights*
						Bottom	*Top/side*	
V1-GS3	11	1	-	-	1	2	-	-
V1-GS2	12	1	-	-	1	2	-	-
V2-GS3	13	1	-	-	1	-	2	-
V2-GS2	14	1	-	-	1	-	2	-
V3-GS3	15	1	1	-	-	2	-	-
V3-GS2	16	1	1	-	-	2	-	-
V4-GS3	17	1	1	-	-	-	2	-
V4-GS2	18	1	1	-	-	-	2	-
V5-GS3	19	1	-	1	-	2	-	-
V5-GS2	20	1	-	1	-	2	-	-
V6-GS3	21	1	-	1	-	-	2	-
V6-GS2	22	1	-	1	-	-	2	-
V7-GS2	23	1	-	-	1	2	2	-
V10-GS2	24	1	1	-	-	2	2	-
V11-GS2	26	1	-	1	-	2	2	-
V12-GS2	28	1	-	-	-	2	-	-
V13-GS2	28	1	-	-	-	-	2	-
V14-GS2	29	1	-	-	-	2	2	-
V15-GC	30	-	1	-	-	-	-	-
V16-GC	31	-	-	1	-	-	-	-
V19-GS2	32	2	-	-	1	4	-	-
V20-GS2	34	2	-	-	1	-	4	-
V21-GS2	36	2	-	-	1	4	4	-
V22-GS2	38	2	1	-	-	4	-	-
V23-GS2	40	2	1	-	-	-	4	-
V24-GS2	42	2	1	-	-	4	4	-
V25-GS2	44	2	-	1	-	4	-	-
V26-GS2	46	2	-	1	-	-	4	-
V27-GS2	48	2	-	1	-	4	4	-
V28-GS2	50	2	-	-	-	4	-	-
V29-GS2	52	2	-	-	-	-	4	-
V30-GS2	54	2	-	-	-	4	4	-
V31-GS2	56	2	-	-	-	2	-	2
V32-GS2	56	2	-	-	-	-	2	2
V33-GS2	57	2	-	-	-	2	2	2

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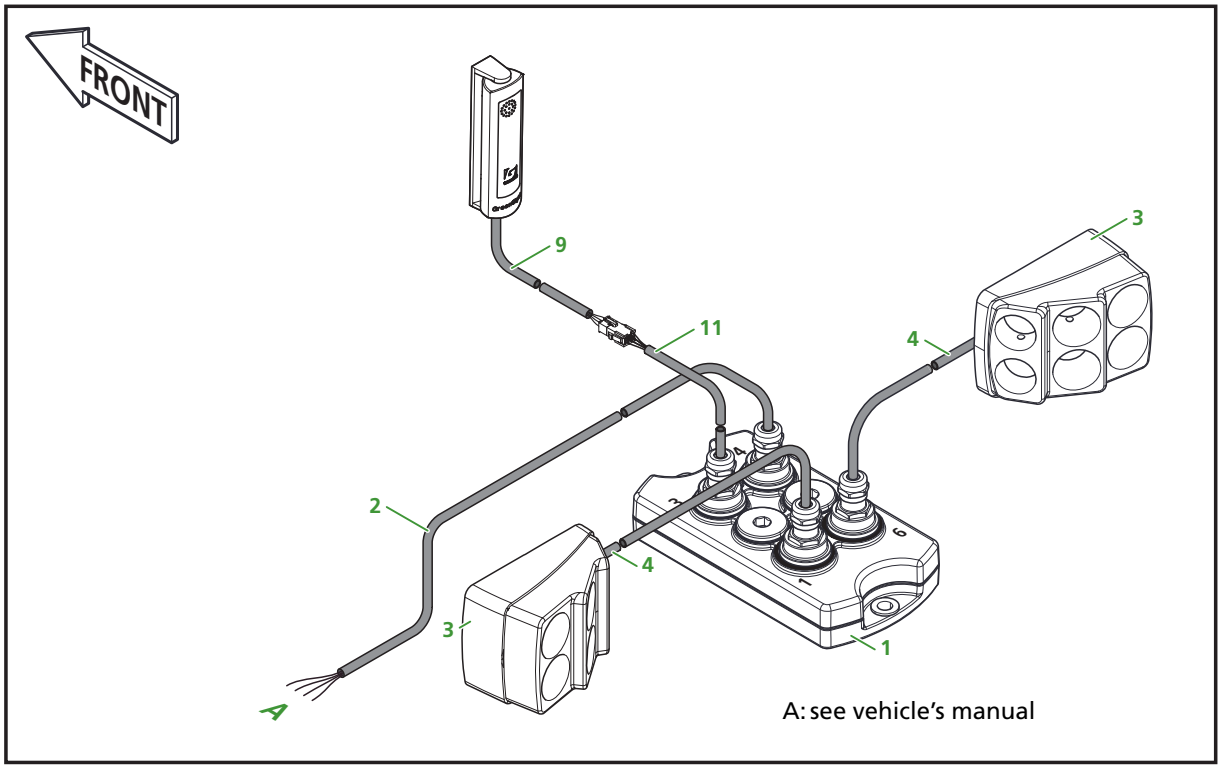
V1-GS3



Parts list V1-GS3

Pos.	*Description*	*Installation*	*Wiring diagram*
1	Control unit	3.1	4.2
2	Power cable 2-/3-wire	-	4.18/4.19
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
9	Display	3.8	4.20
11	Display cable	-	4.16
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
	Diagnosis cable	6.2	4.23

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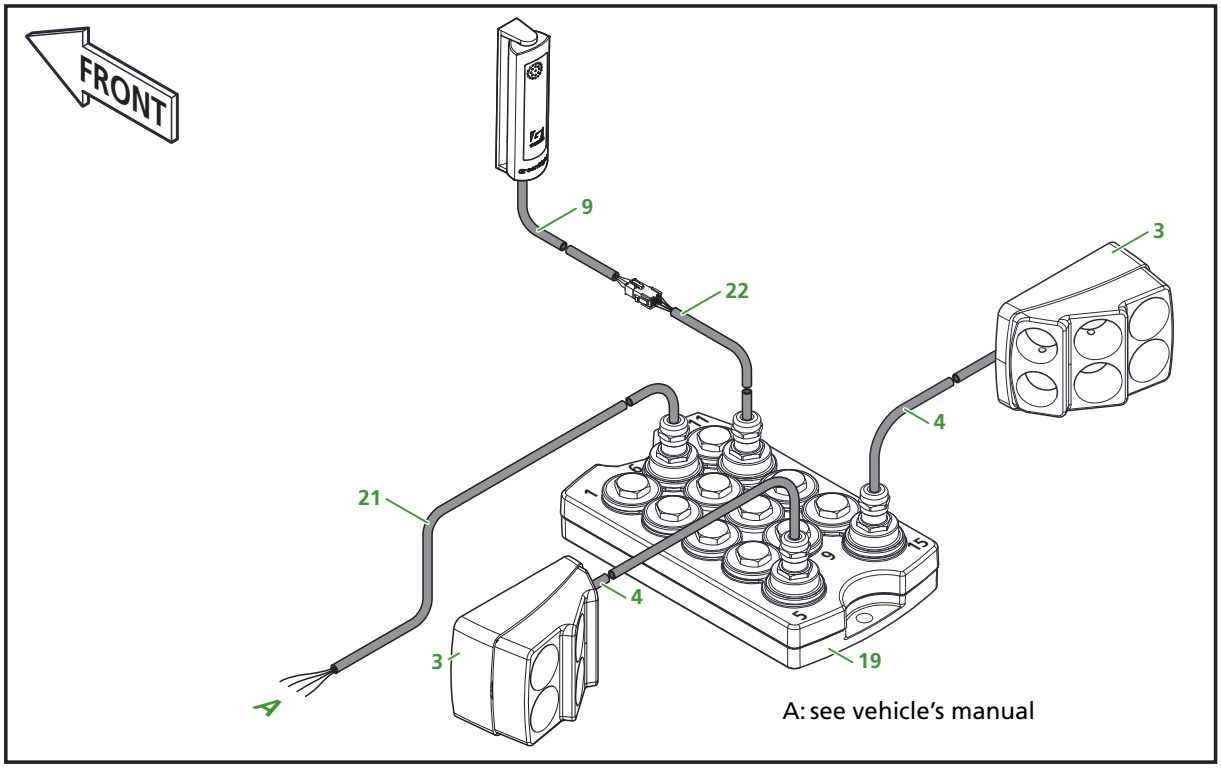
V1-GS2



Parts list V1-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
9	Display	3.8	4.20
19	Control unit (VP excluded)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
22	Display cable	-	4.10
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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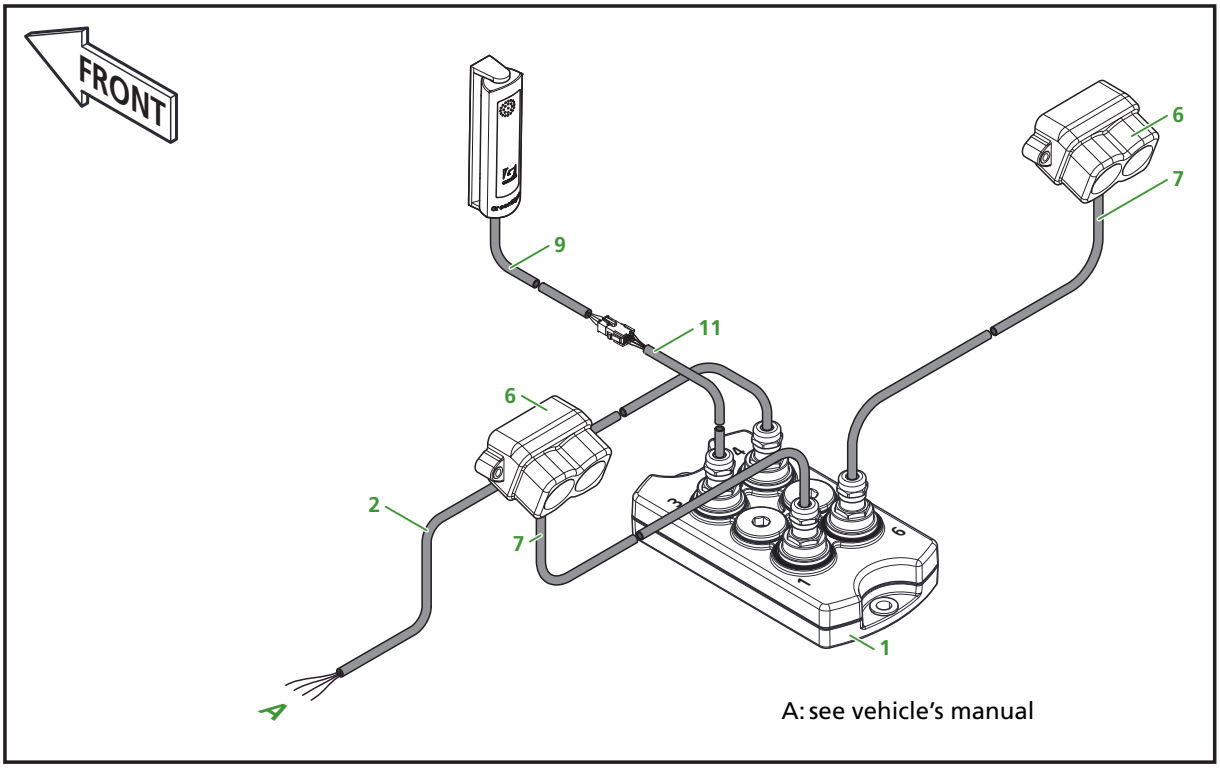
V2-GS3



Parts list V2-GS3

Pos.	*Description*	*Installation*	*Wiring diagram*
1	Control unit	3.1	4.2
2	Power cable 2-/3-wire	-	4.18/4.19
6	Top/side sensor	3.2	4.15
7	Top/side sensor cable	-	4.15
9	Display	3.8	4.20
11	Display cable	-	4.16
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
	Diagnosis cable	6.2	4.23

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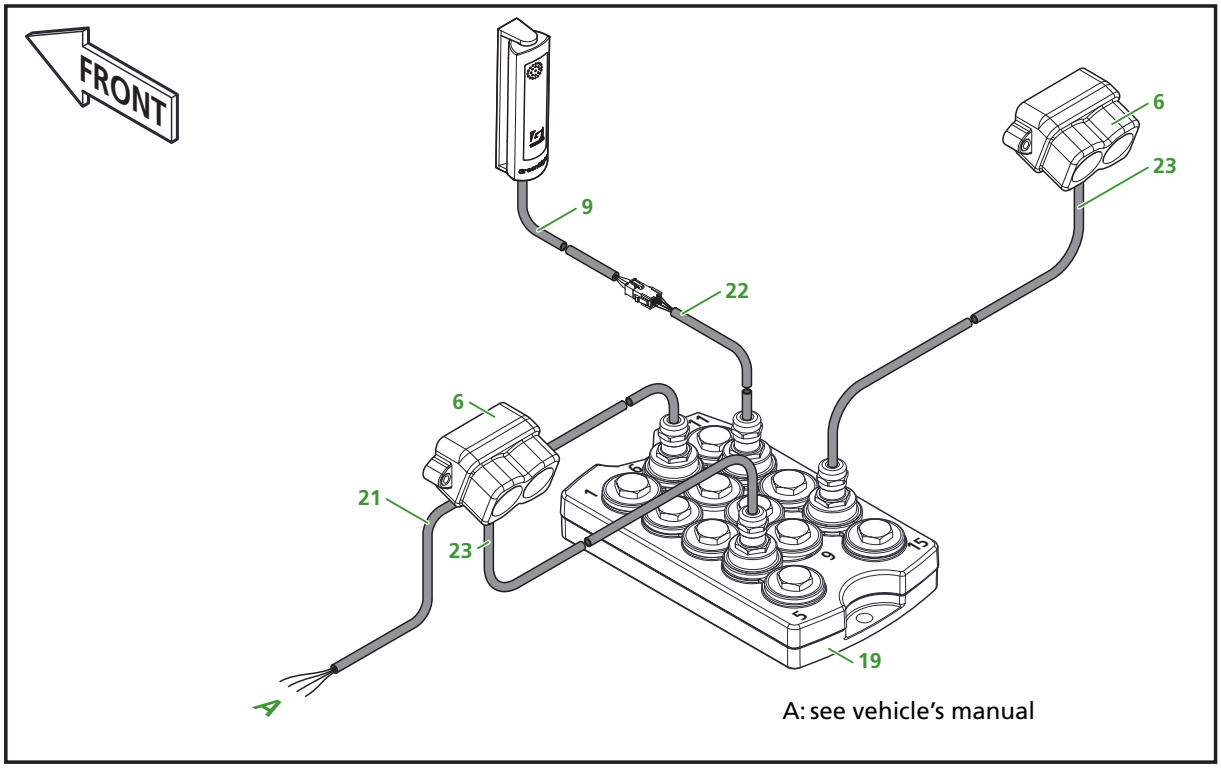
V2-GS2



Parts list V2-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
6	Top/side sensor	3.2	4.6
9	Display	3.8	4.20
19	Control unit (VP excluded)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
22	Display cable	-	4.10
23	Top/side sensor cable	-	4.6
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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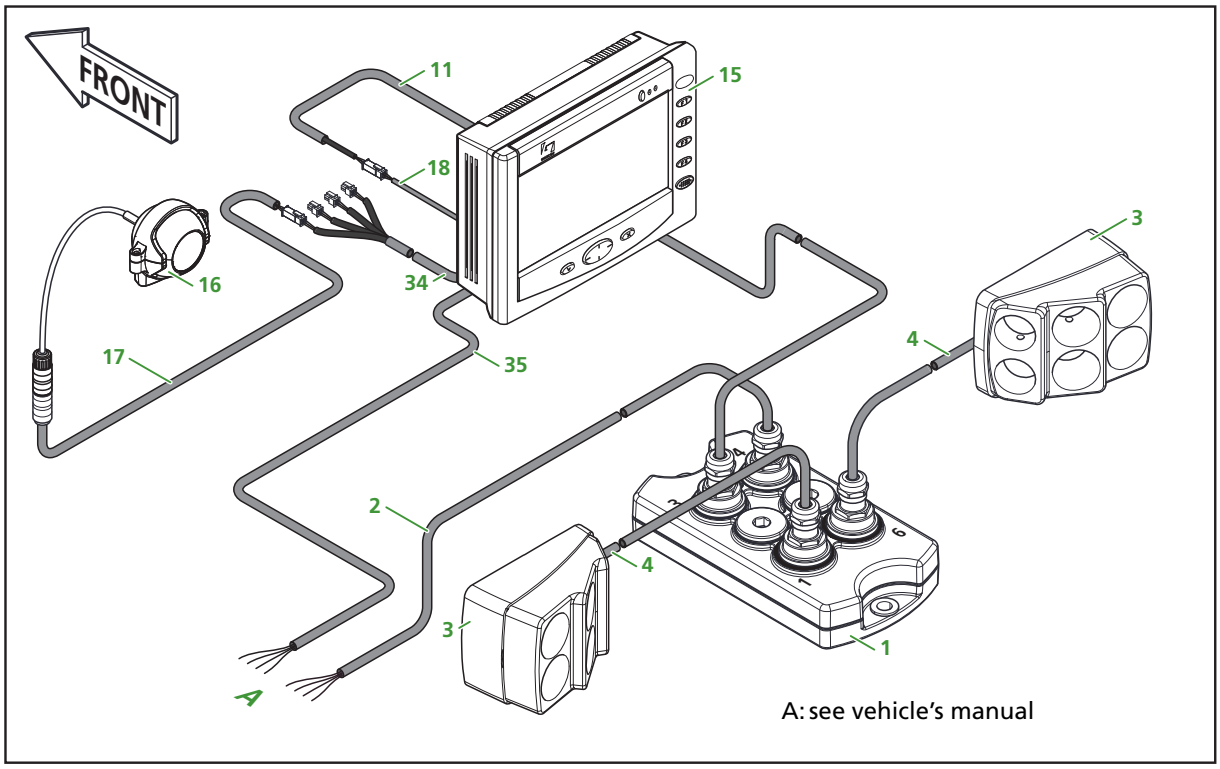
V3-GS3



Parts list V3-GS3

Pos.	*Description*	*Installation*	*Wiring diagram*
1	Control unit	3.1	4.2
2	Power cable 2-/3-wire	-	4.18/4.19
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
11	Monitor cable	-	4.17
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
	Diagnosis cable	6.2	4.23

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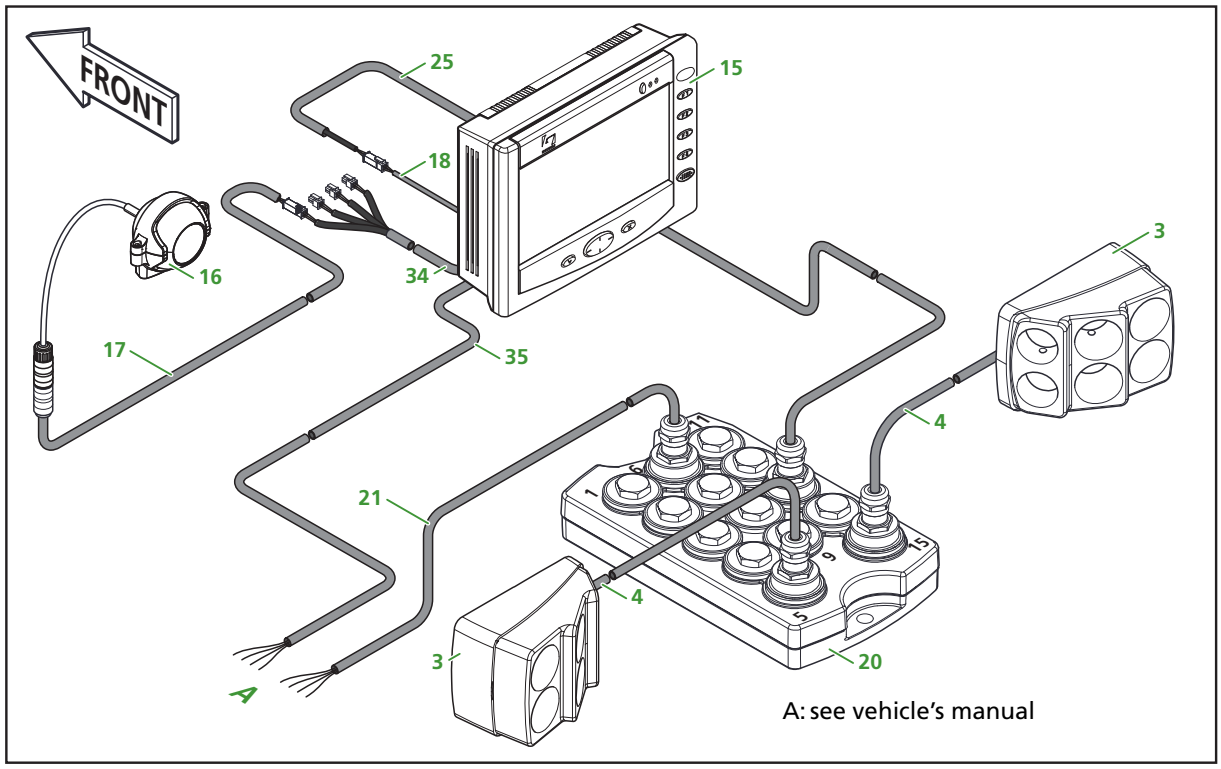
V3-GS2



Parts list V3-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
25	Monitor cable (NO camera on U3)	-	4.11
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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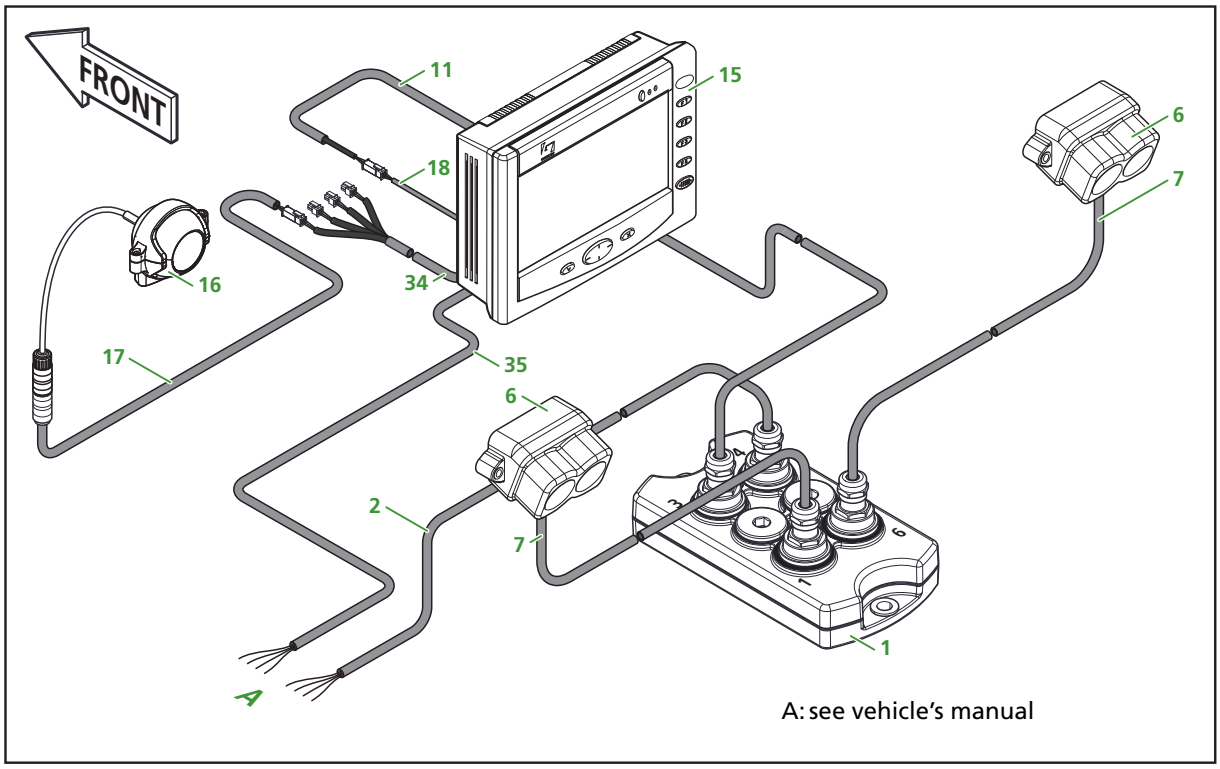
V4-GS3



Parts list V4-GS3

Pos.	*Description*	*Installation*	*Wiring diagram*
1	Control unit	3.1	4.2
2	Power cable 2-/3-wire	-	4.18/4.19
6	Top/side sensor	3.2	4.15
7	Top/side sensor cable	-	4.15
11	Monitor cable	-	4.17
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
	Diagnosis cable	6.2	4.23

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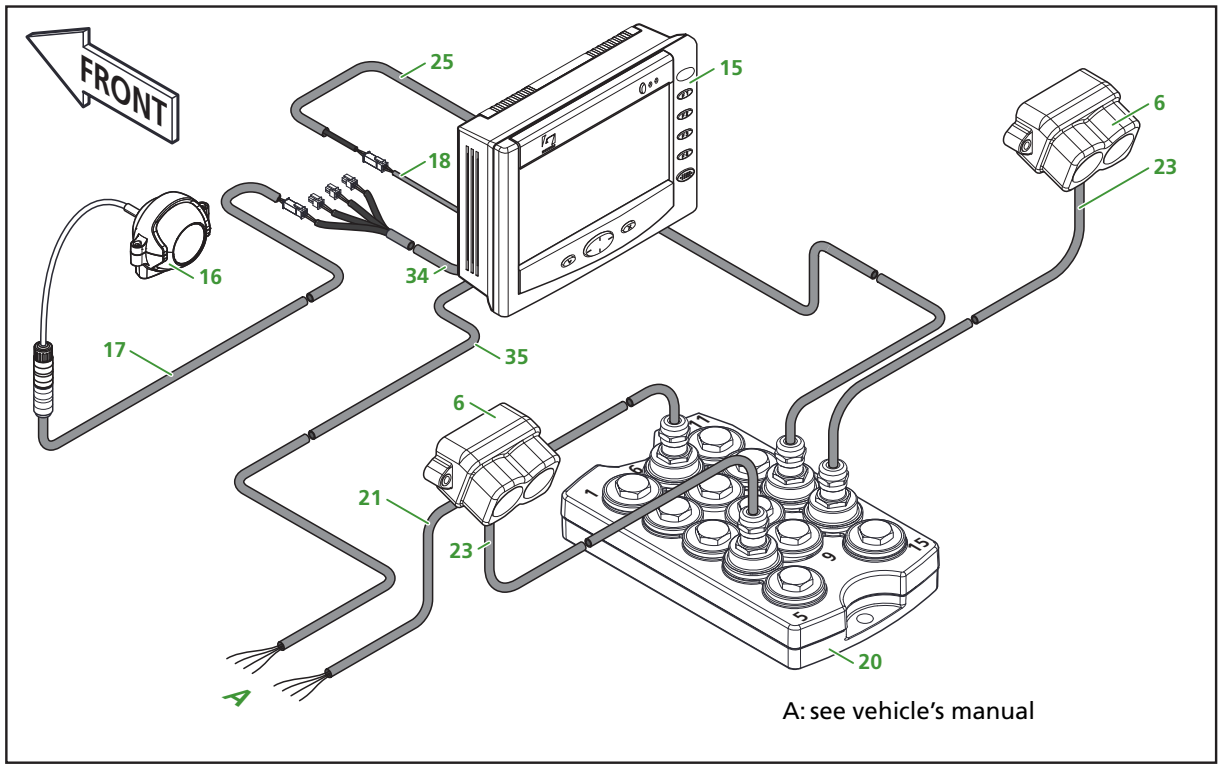
V4-GS2



Parts list V4-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
6	Top/side sensor	3.2	4.6
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable (NO camera on U3)	-	4.11
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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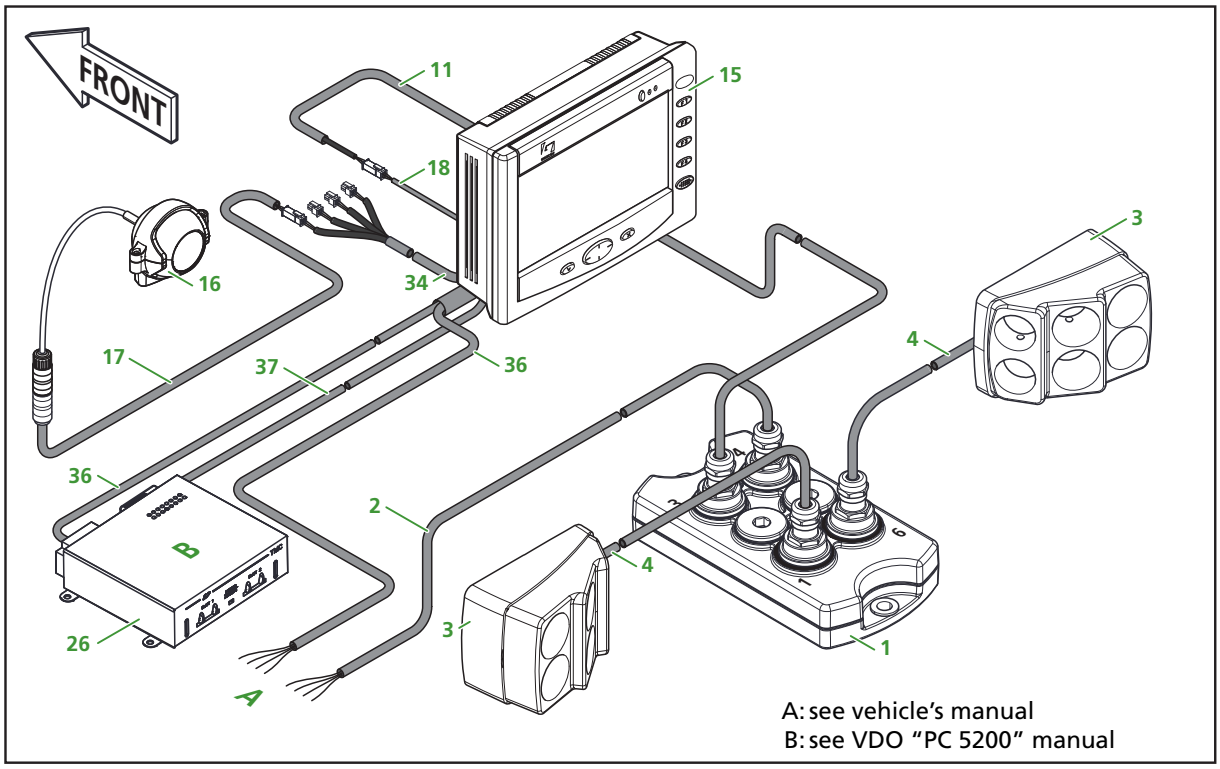
V5-GS3



Parts list V5-GS3

Pos.	*Description*	*Installation*	*Wiring diagram*
1	Control unit	3.1	4.2
2	Power cable 2-/3-wire	-	4.18/4.19
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
11	Monitor cable	-	4.17
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
26	Navigation	-	4.25
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
	Diagnosis cable	6.2	4.23

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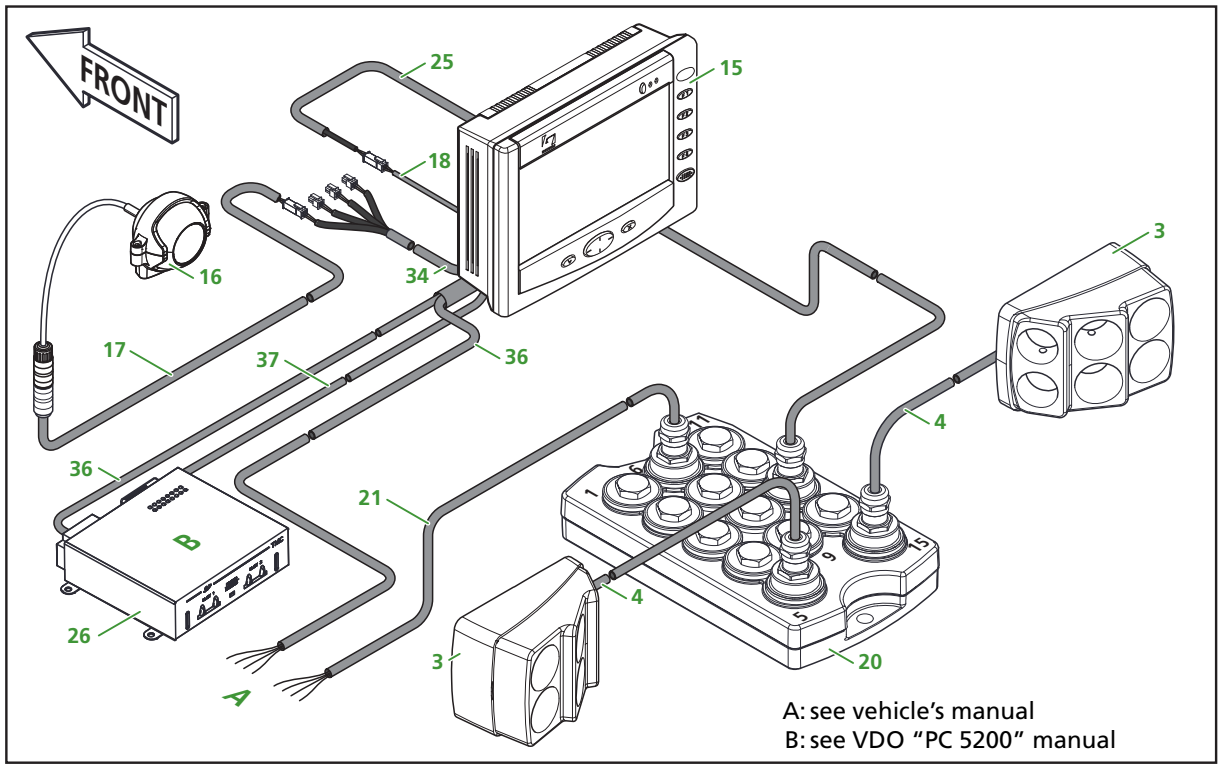
V5-GS2



Parts list V5-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
25	Monitor cable (NO camera on U3)	-	4.11
26	Navigation	-	4.25
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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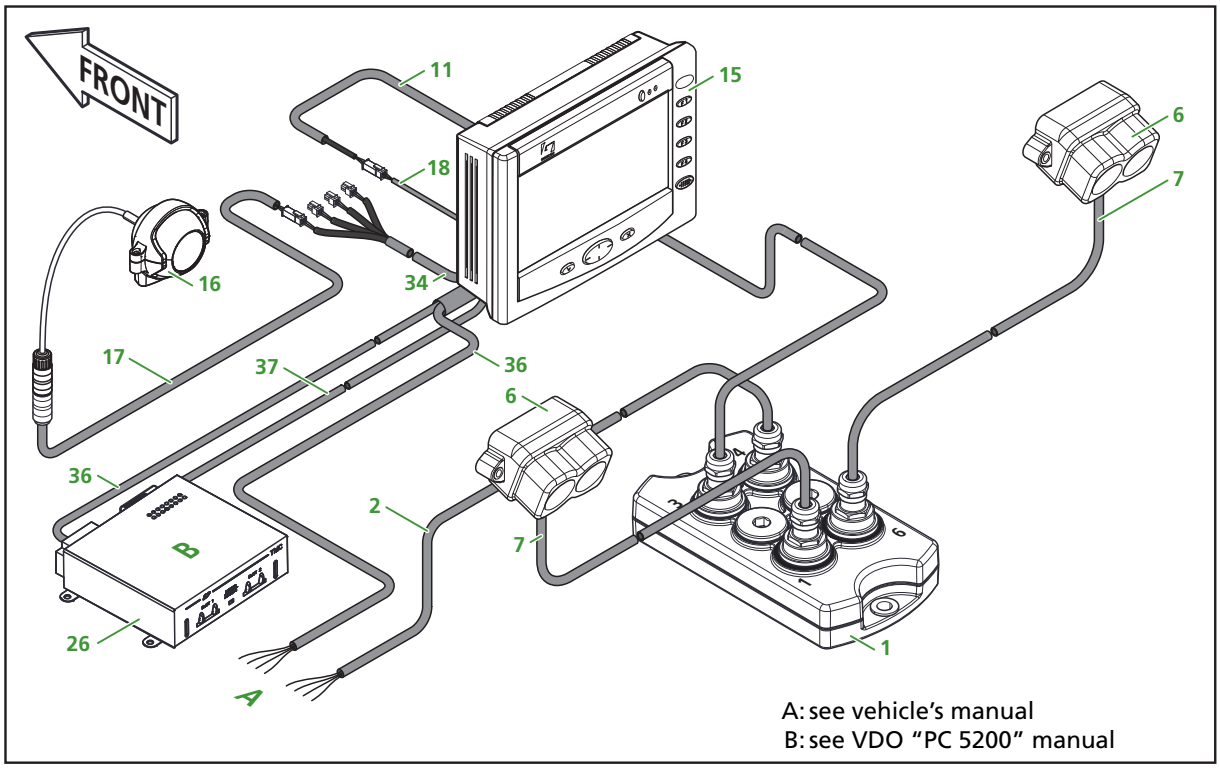
V6-GS3

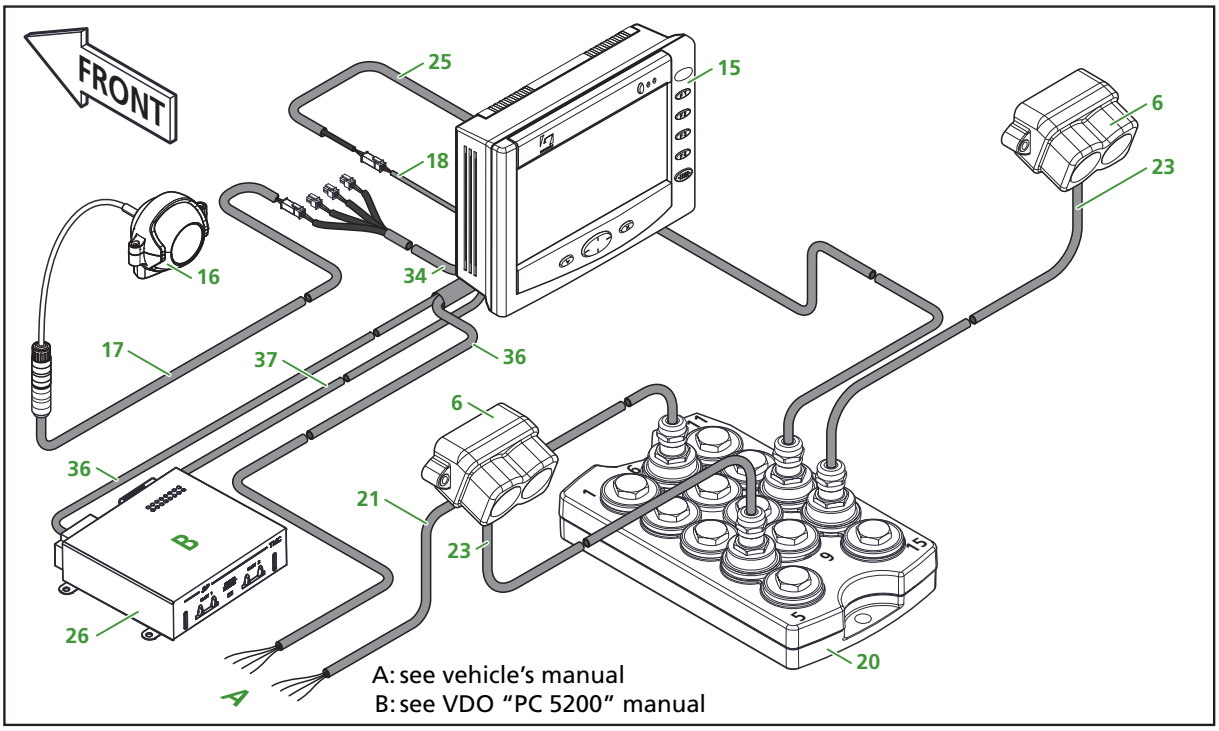


Parts list V6-GS3

Pos.	*Description*	*Installation*	*Wiring diagram*
1	Control unit	3.1	4.2
2	Power cable 2-/3-wire	-	4.18/4.19
6	Top/side sensor	3.2	4.15
7	Top/side sensor cable	-	4.15
11	Monitor cable	-	4.17
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
26	Navigation	-	4.25
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V6-GS2

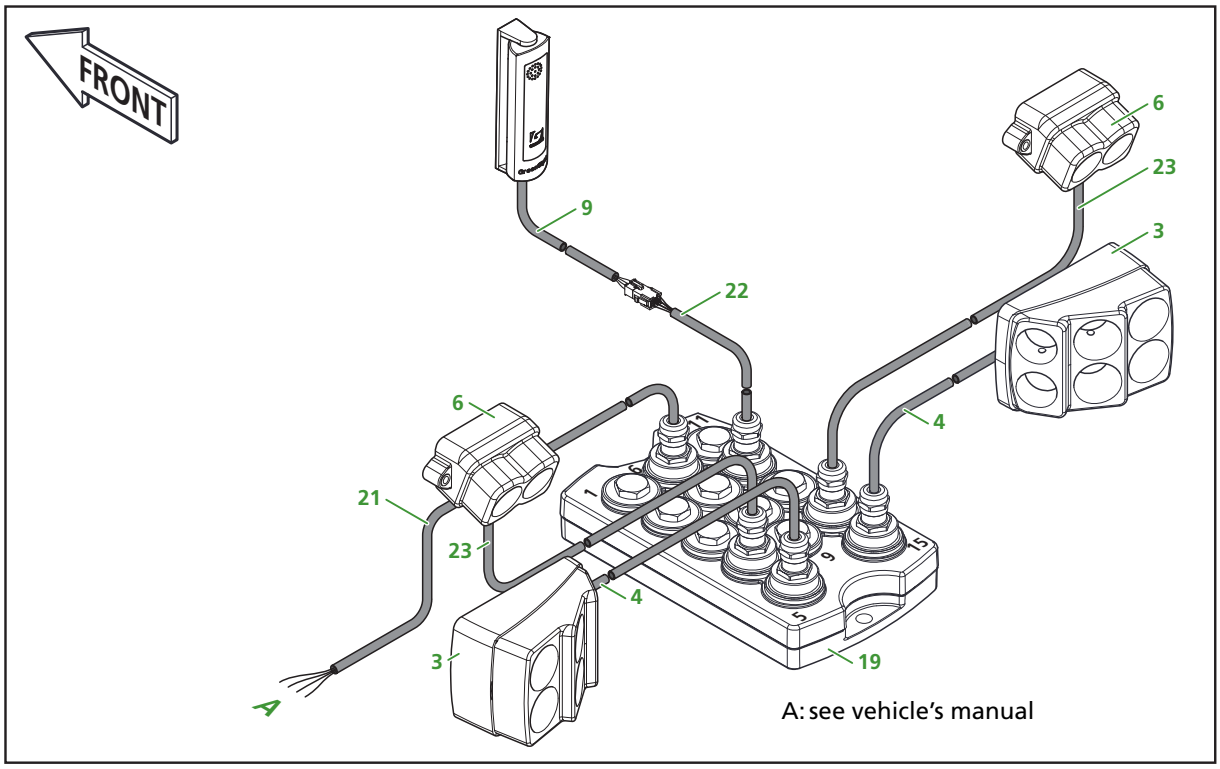


Parts list V6-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
6	Top/side sensor	3.2	4.6
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable (NO camera on U3)	-	4.11
26	Navigation	-	4.25
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V7-GS2

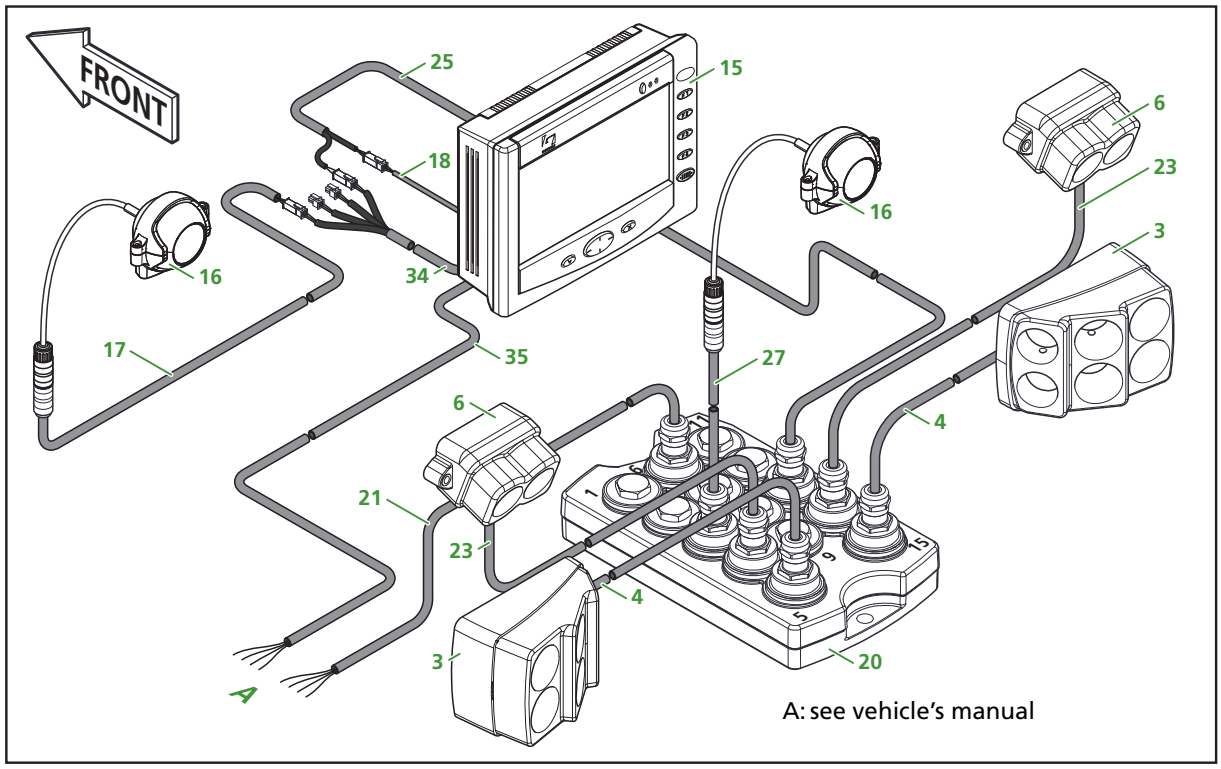


Parts list V7-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
9	Display	3.8	4.20
19	Control unit (VP excluded)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
22	Display cable	-	4.10
23	Top/side sensor cable	-	4.6
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V10-GS2



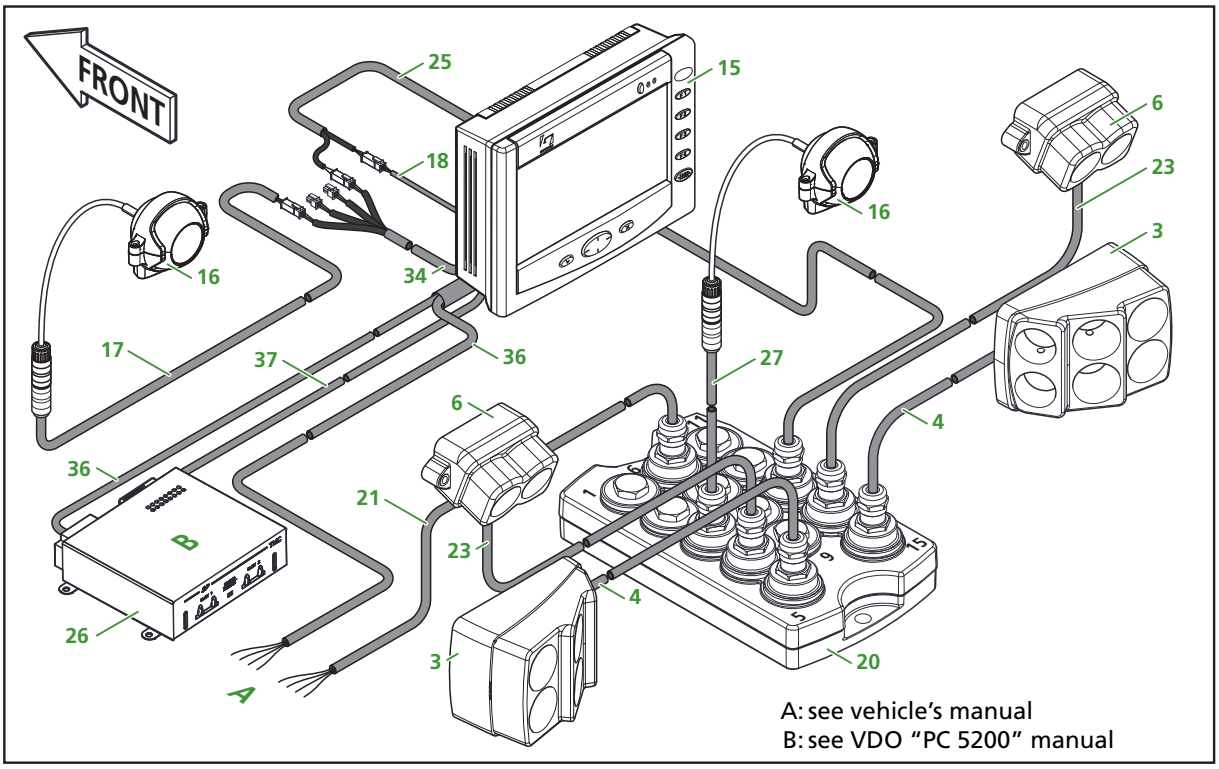
Date of issue : November 2010

Parts list V10-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable (camera on U3)	-	4.12
27	Camera cable (GS2)	-	4.5
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V11-GS2



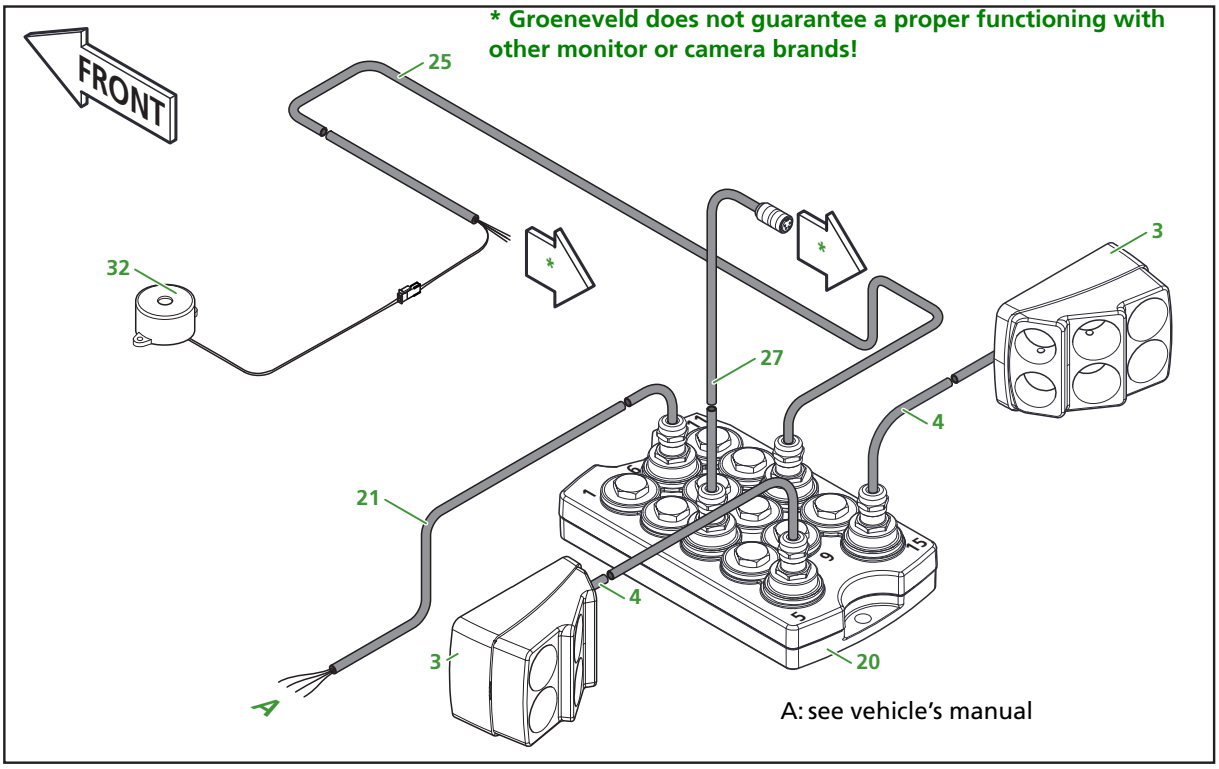
Date of issue : November 2010

Parts list V11-GS2

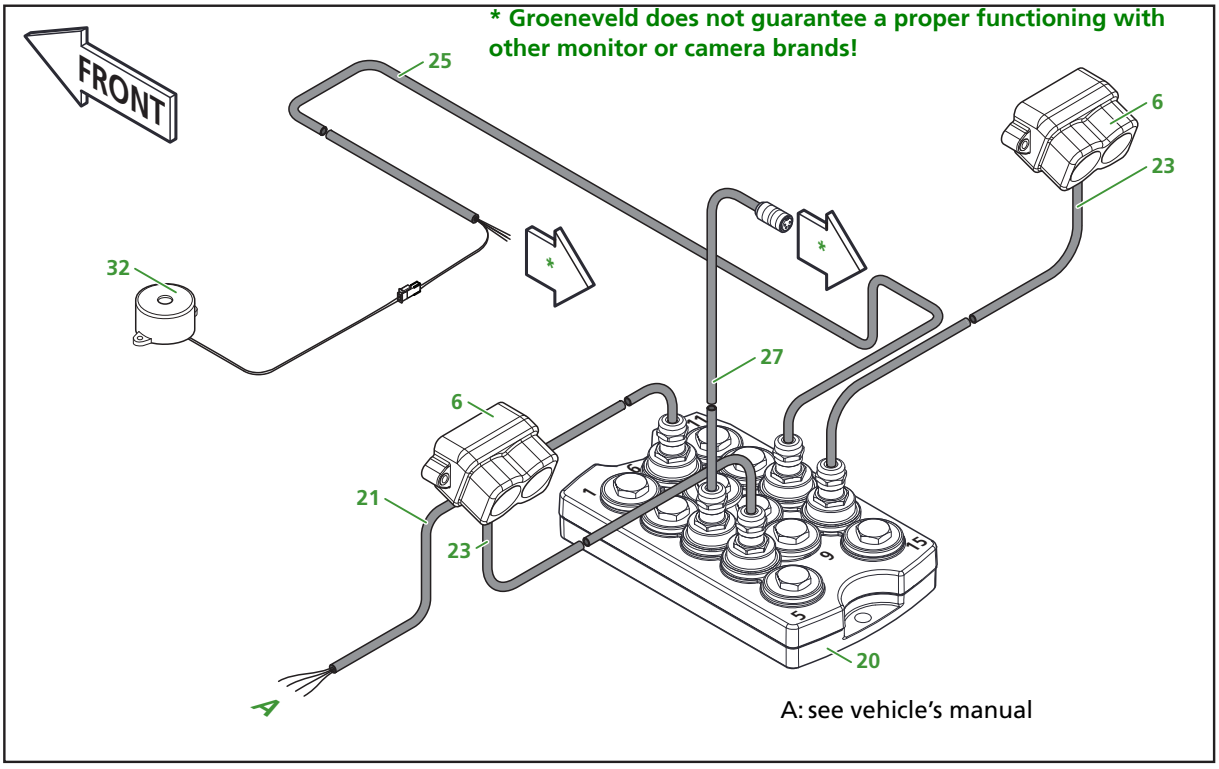
Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable (camera on U3)	-	4.12
26	Navigation	-	4.25
27	Camera cable (GS2)	-	4.5
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V12-GS2

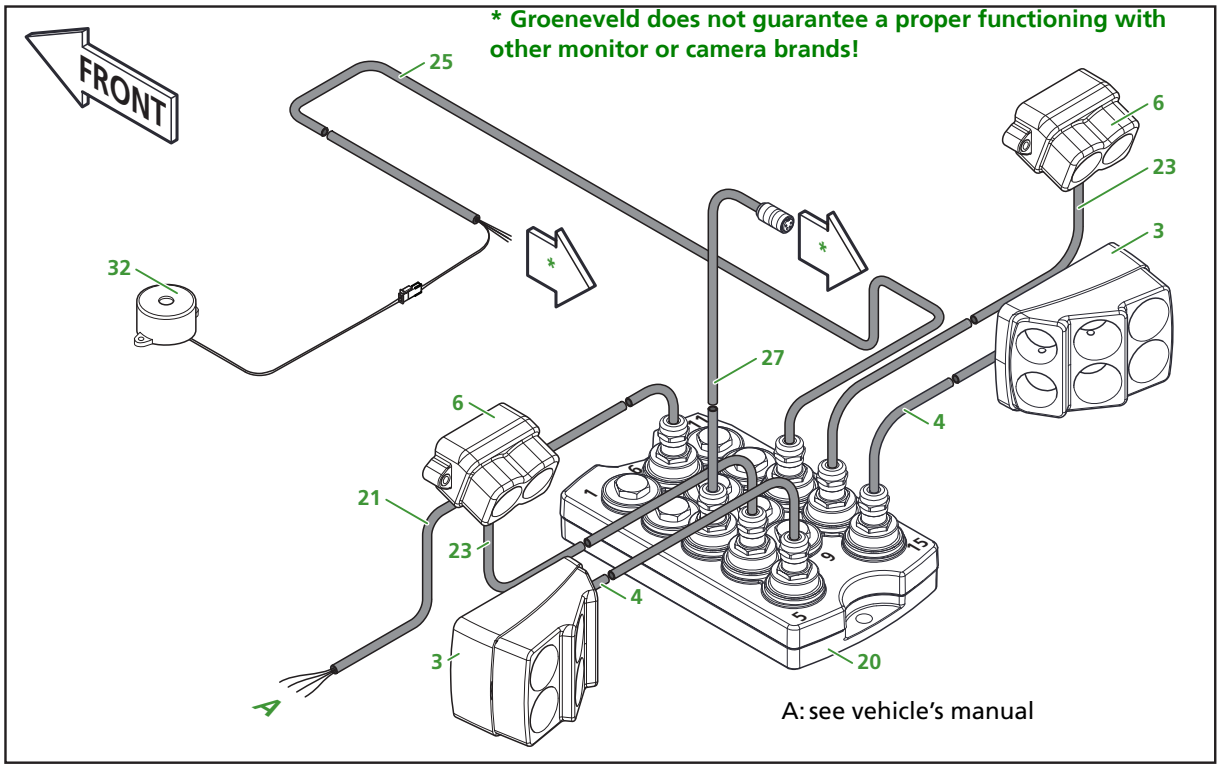


V13-GS2



Date of issue : November 2010

V14-GS2

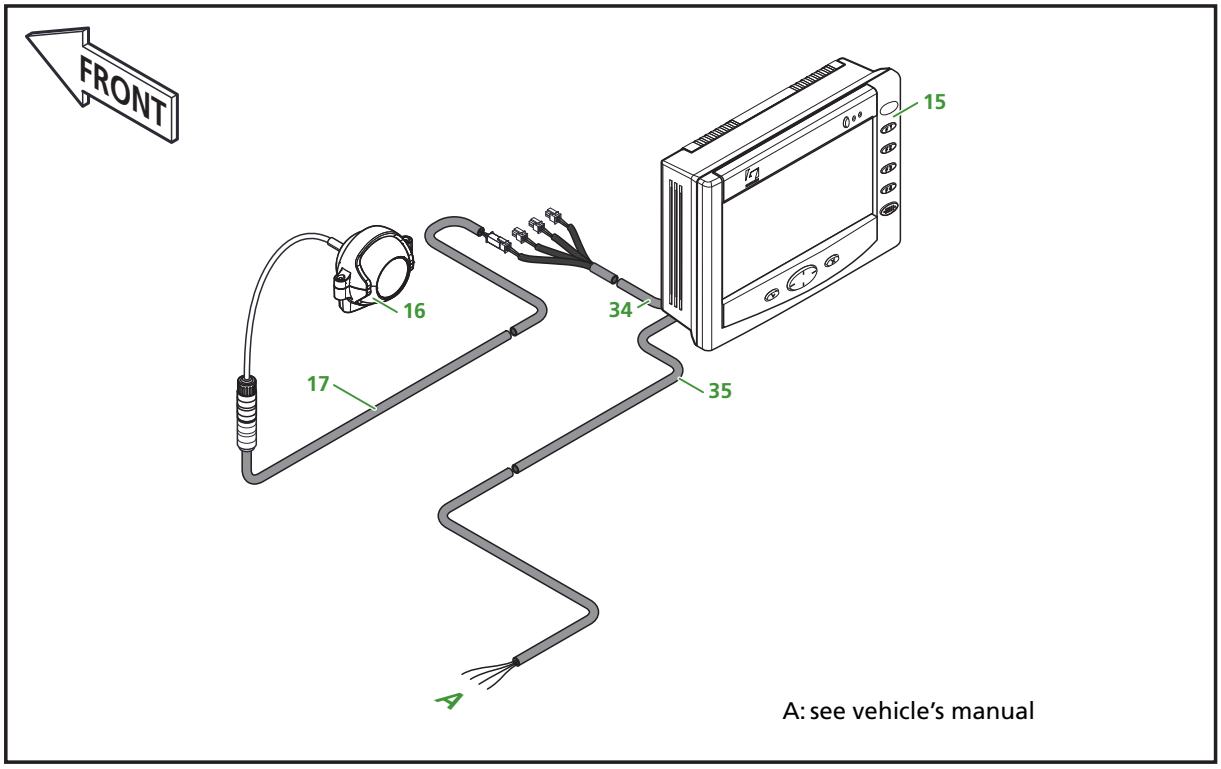


Parts list V12-GS2, V13-GS2 and V14-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable for other brand	-	4.13
27	Camera cable (GS2)	-	4.5
32	Buzzer	-	4.14
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
14	Spiral cable	3.3	4.22
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V15-GC

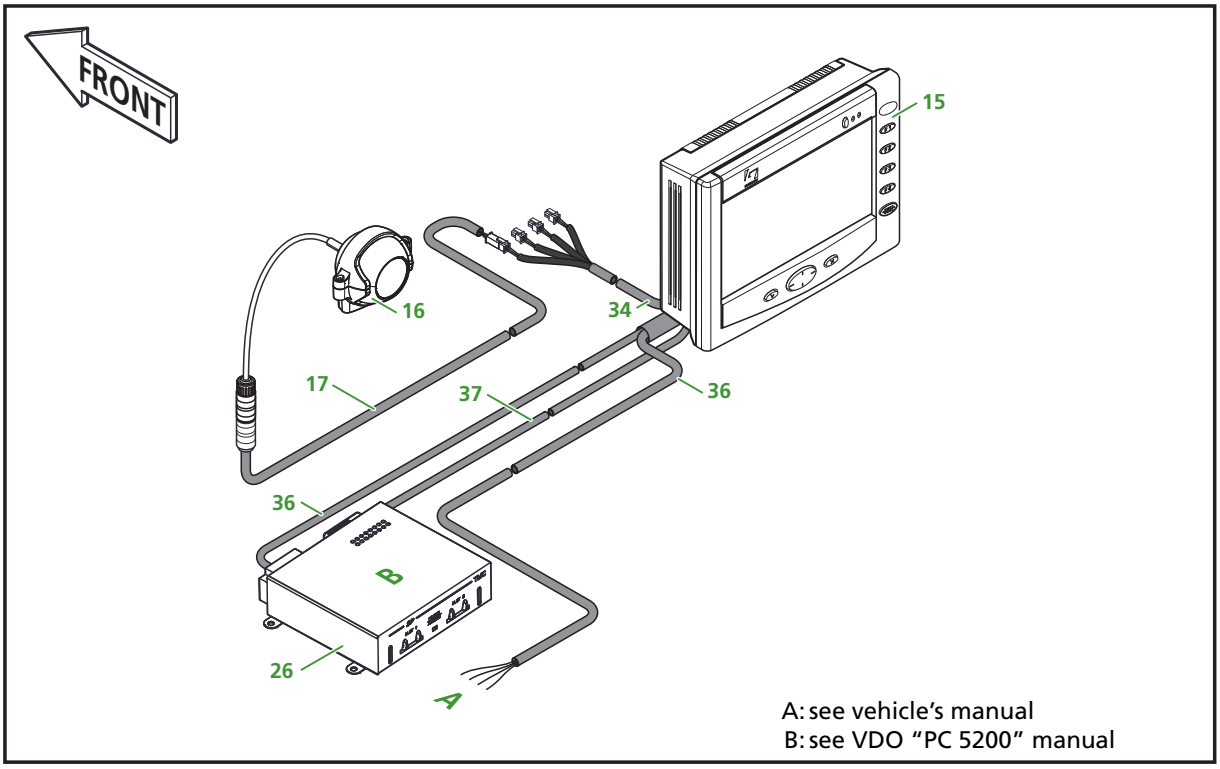


Parts list V15-GC

Pos.	*Description*	*Installation*	*Wiring diagram*
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
14	Spiral cable	3.3	4.22

Date of issue : November 2010

V16-GC

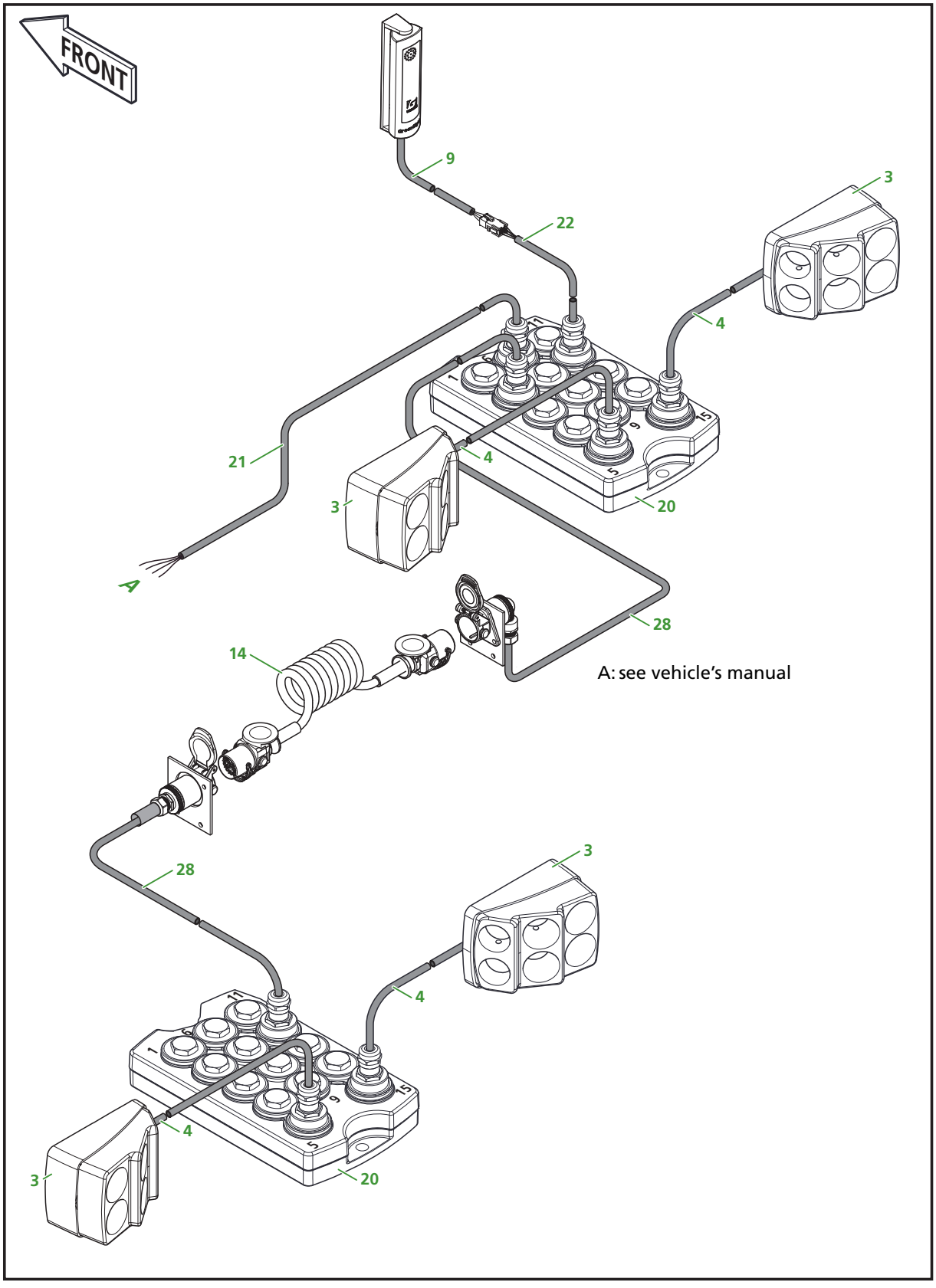


Parts list V16-GC

Pos.	*Description*	*Installation*	*Wiring diagram*
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
26	Navigation	-	4.25
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
14	Spiral cable	3.3	4.22

Date of issue : November 2010

V19-GS2



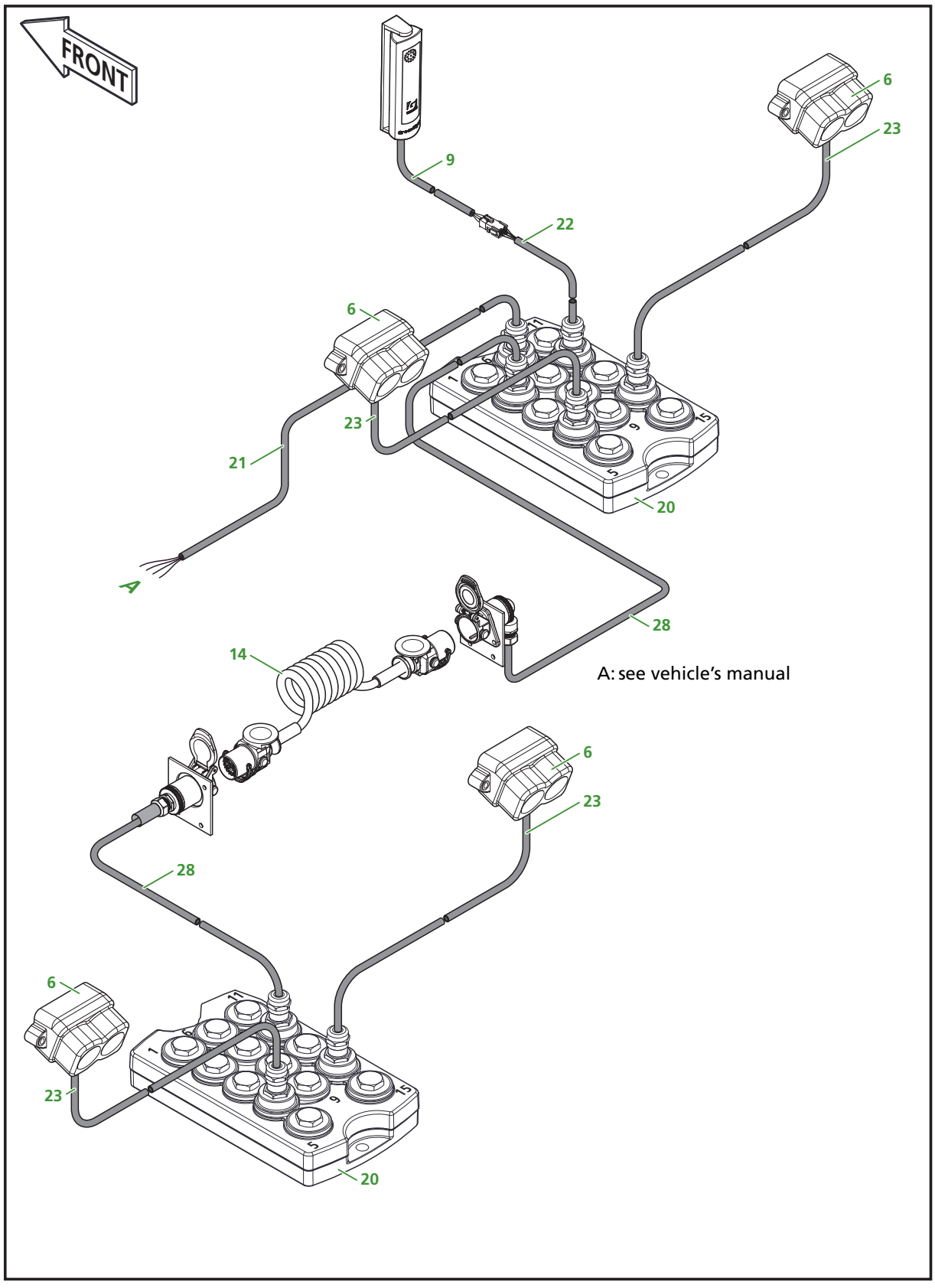
Date of issue : November 2010

Parts list V19-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
9	Display	3.8	4.20
14	Spiral cable	3.3	4.22
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
22	Display cable	-	4.10
28	Video CAN circuit cable	-	4.4
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V20-GS2



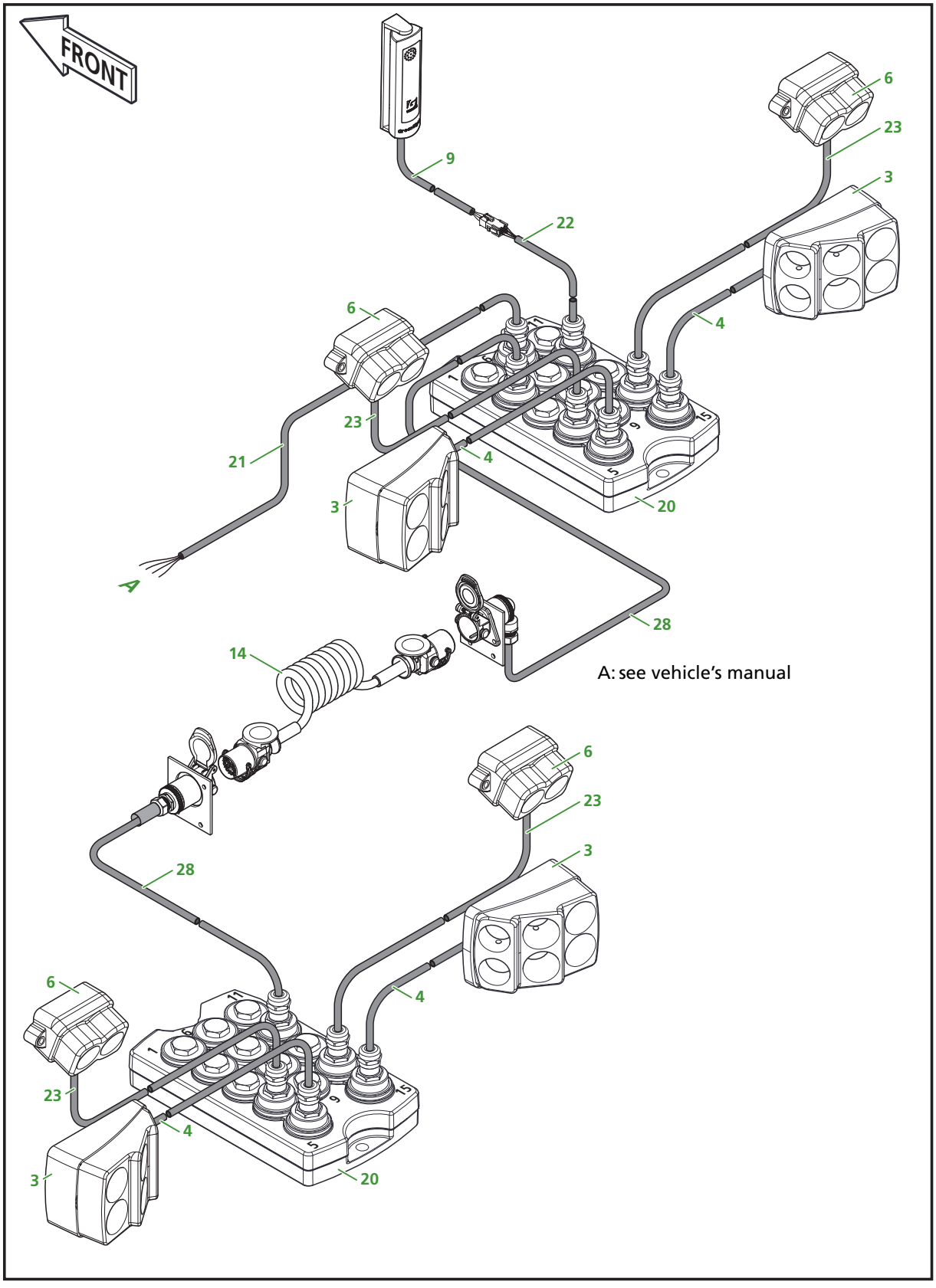
Date of issue : November 2010

Parts list V20-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
6	Top/side sensor	3.2	4.6
9	Display	3.8	4.20
14	Spiral cable	3.3	4.22
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
22	Display cable	-	4.10
23	Top/side sensor cable	-	4.6
28	Video CAN circuit cable	-	4.4
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V21-GS2



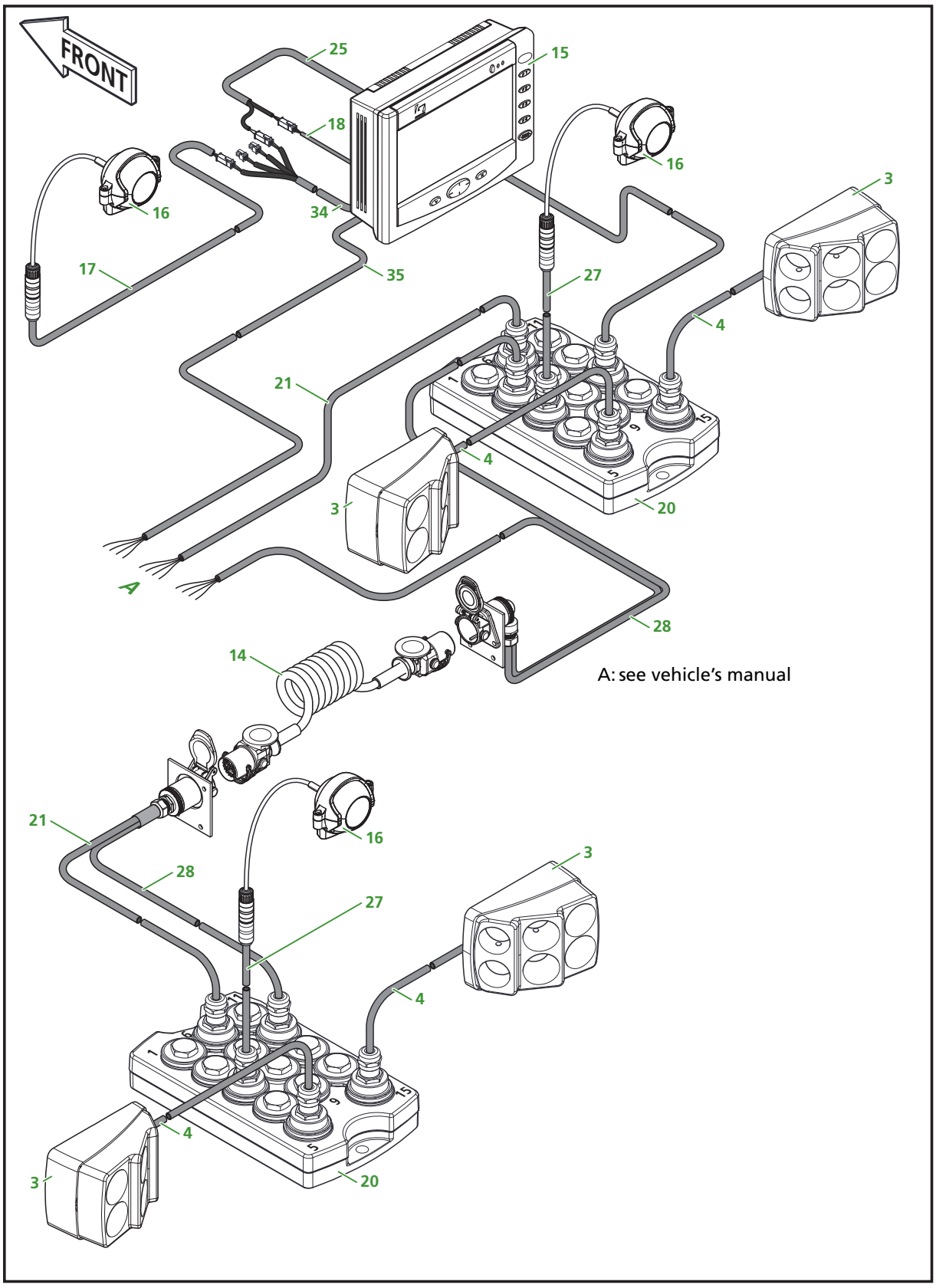
Date of issue : November 2010

Parts list V21-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
9	Display	3.8	4.20
14	Spiral cable	3.3	4.22
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
22	Display cable	-	4.10
23	Top/side sensor cable	-	4.6
28	Video CAN circuit cable	-	4.4
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V22-GS2



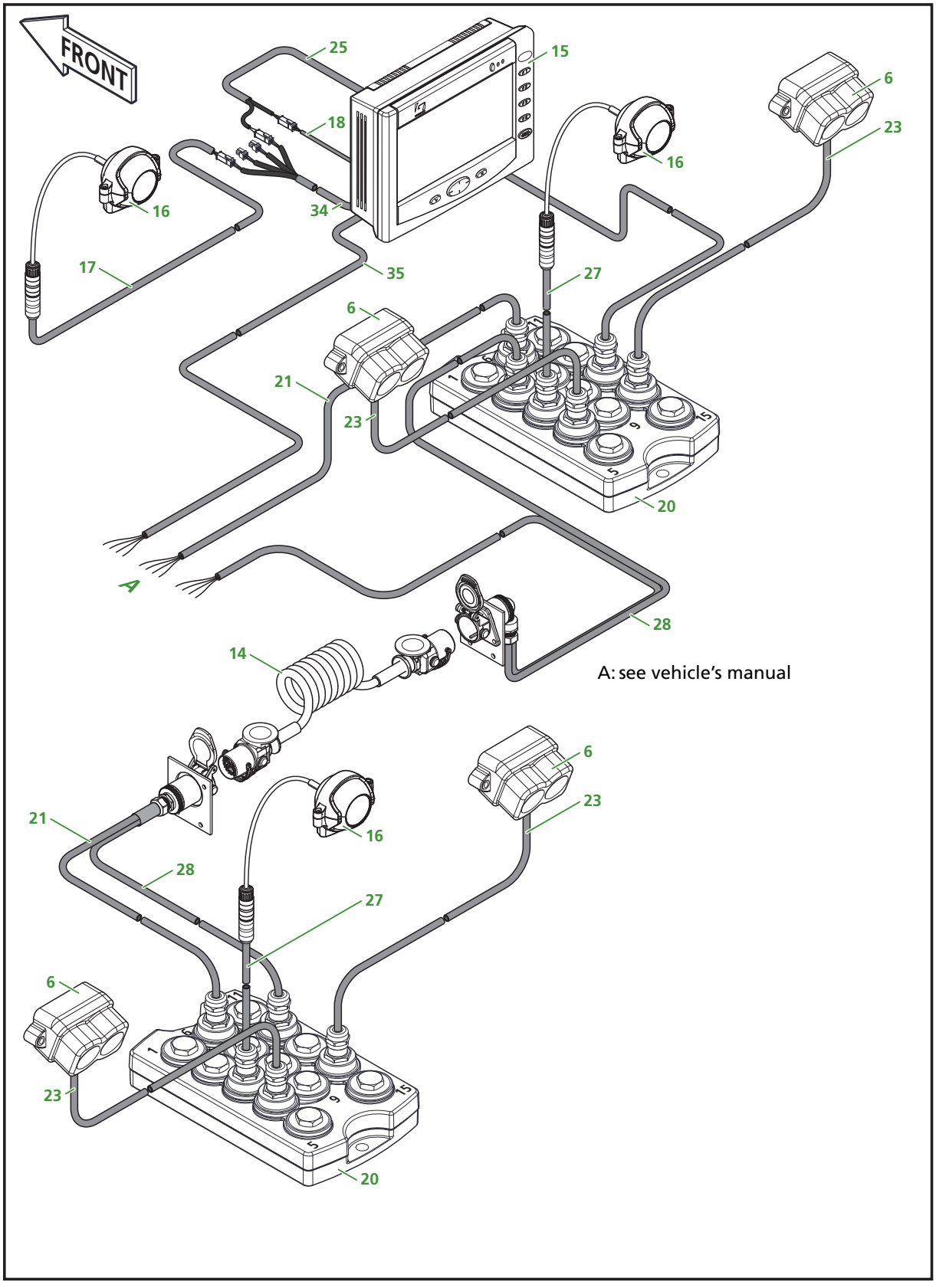
Date of issue : November 2010

Parts list V22-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
14	Spiral cable	3.3	4.22
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
25	Monitor cable (camera on U3)	-	4.12
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V23-GS2



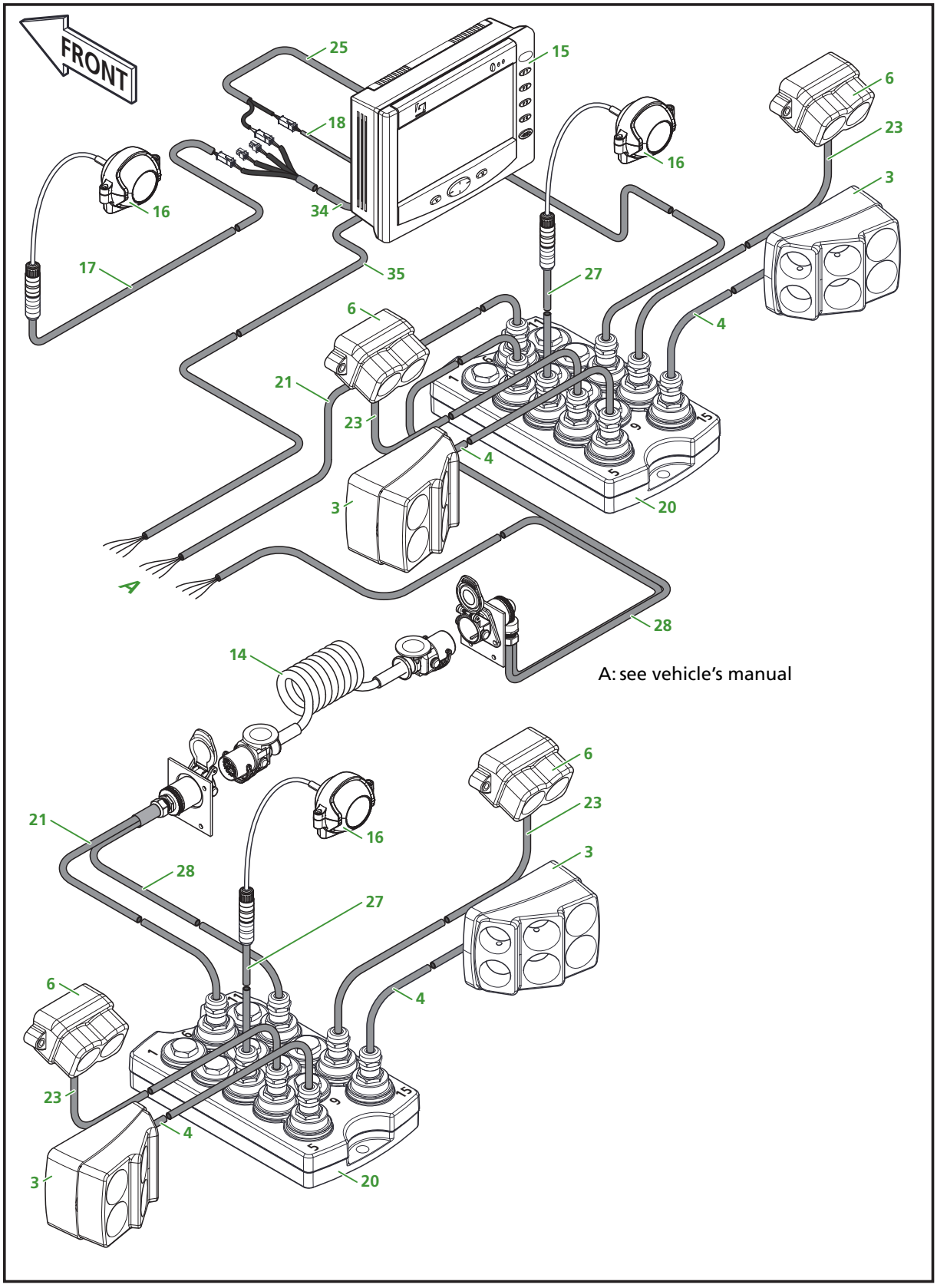
Date of issue : November 2010

Parts list V23-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
6	Top/side sensor	3.2	4.6
14	Spiral cable	3.3	4.22
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable (camera on U3)	-	4.12
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

Date of issue : November 2010

V24-GS2



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Parts list V24-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
14	Spiral cable	3.3	4.22
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable (camera on U3)	-	4.12
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
34	Camera cable (GC)	-	4.27
35	Power cable	-	4.31
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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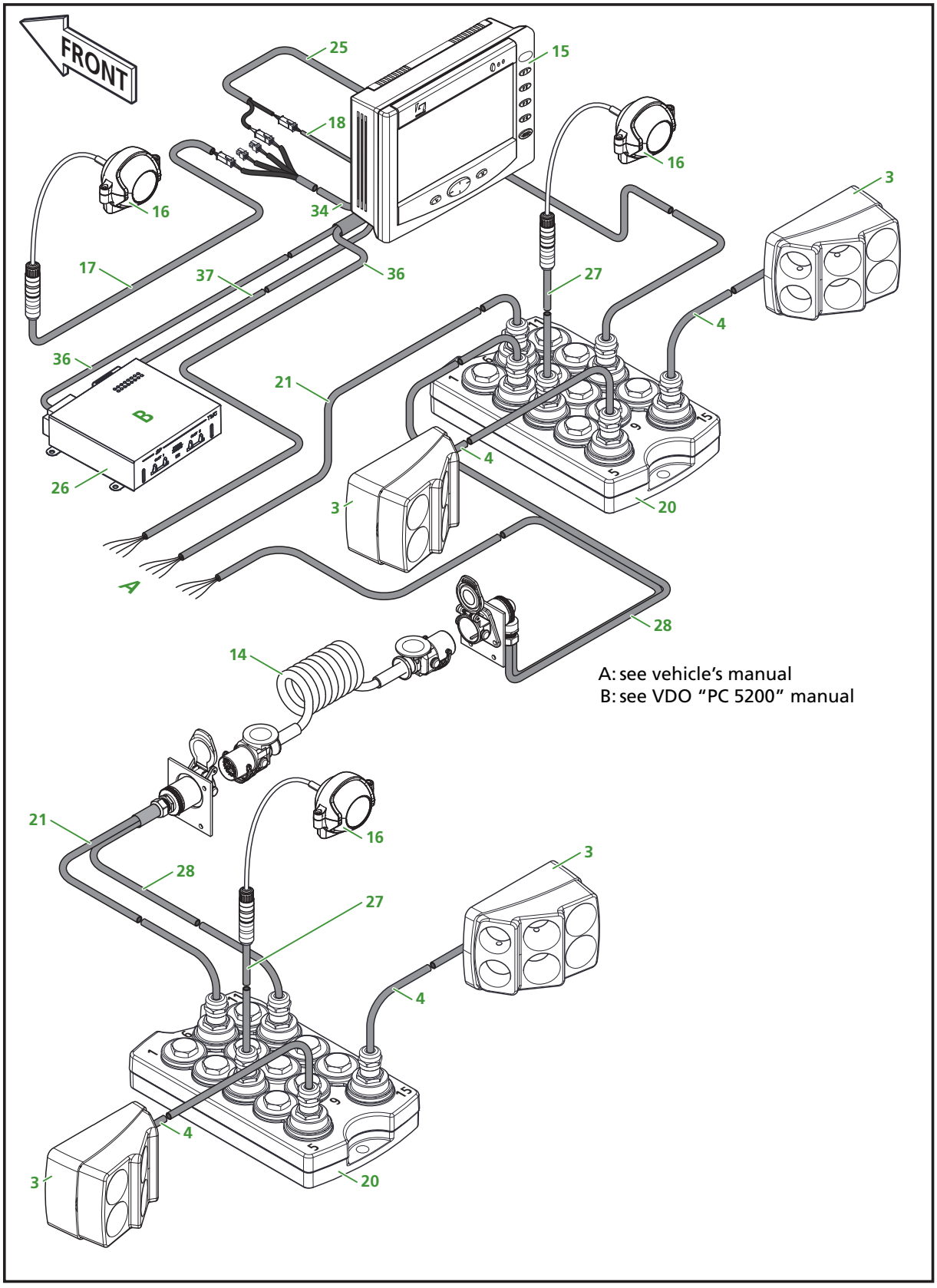
V25-GS2



Date of issue : November 2010

Parts list V25-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
14	Spiral cable	3.3	4.22
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
25	Monitor cable (camera on U3)	-	4.12
26	Navigation	-	4.25
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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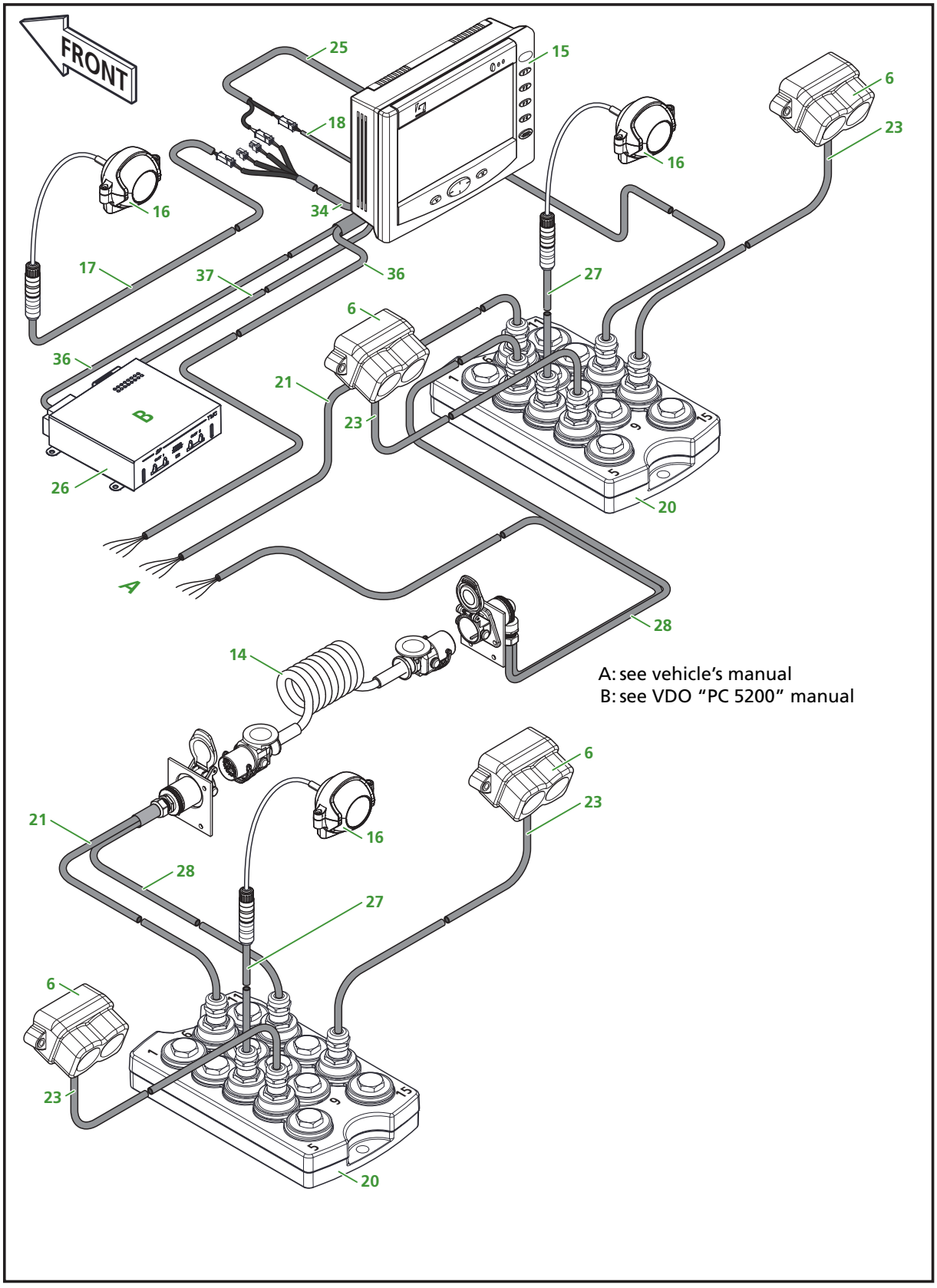
V26-GS2



Date of issue : November 2010

Parts list V26-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
6	Top/side sensor	3.2	4.6
14	Spiral cable	3.3	4.22
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable (camera on U3)	-	4.12
26	Navigation	-	4.25
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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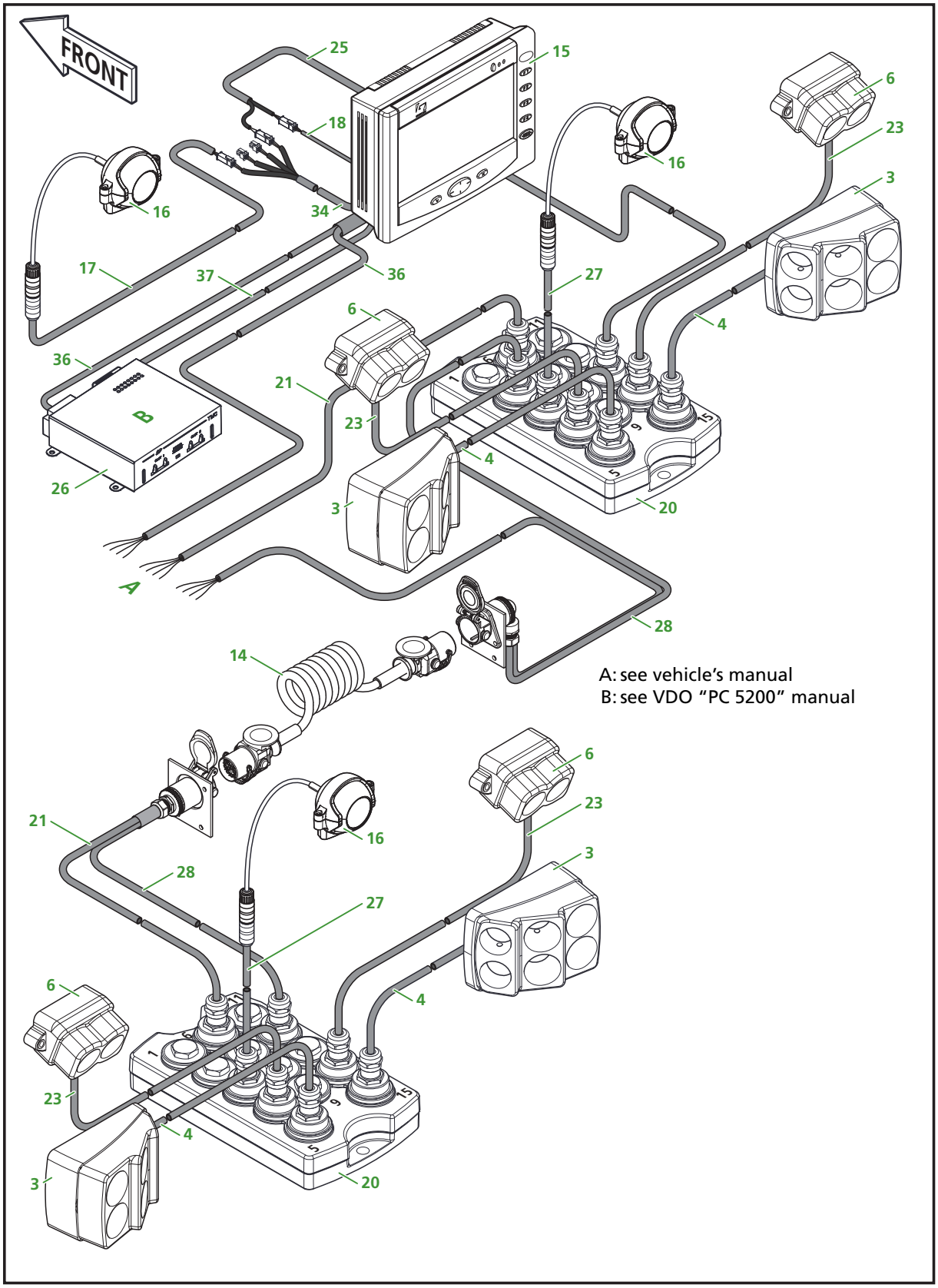
V27-GS2



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Parts list V27-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
14	Spiral cable	3.3	4.22
15	Monitor	3.9	4.25
16	Camera	3.6	4.29
17	Camera interconnection cable	-	4.28
18	CAN cable	-	4.32
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable (camera on U3)	-	4.12
26	Navigation	-	4.25
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
34	Camera cable (GC)	-	4.27
36	Power cable + VDO COM	-	4.30
37	Video cable	-	4.26
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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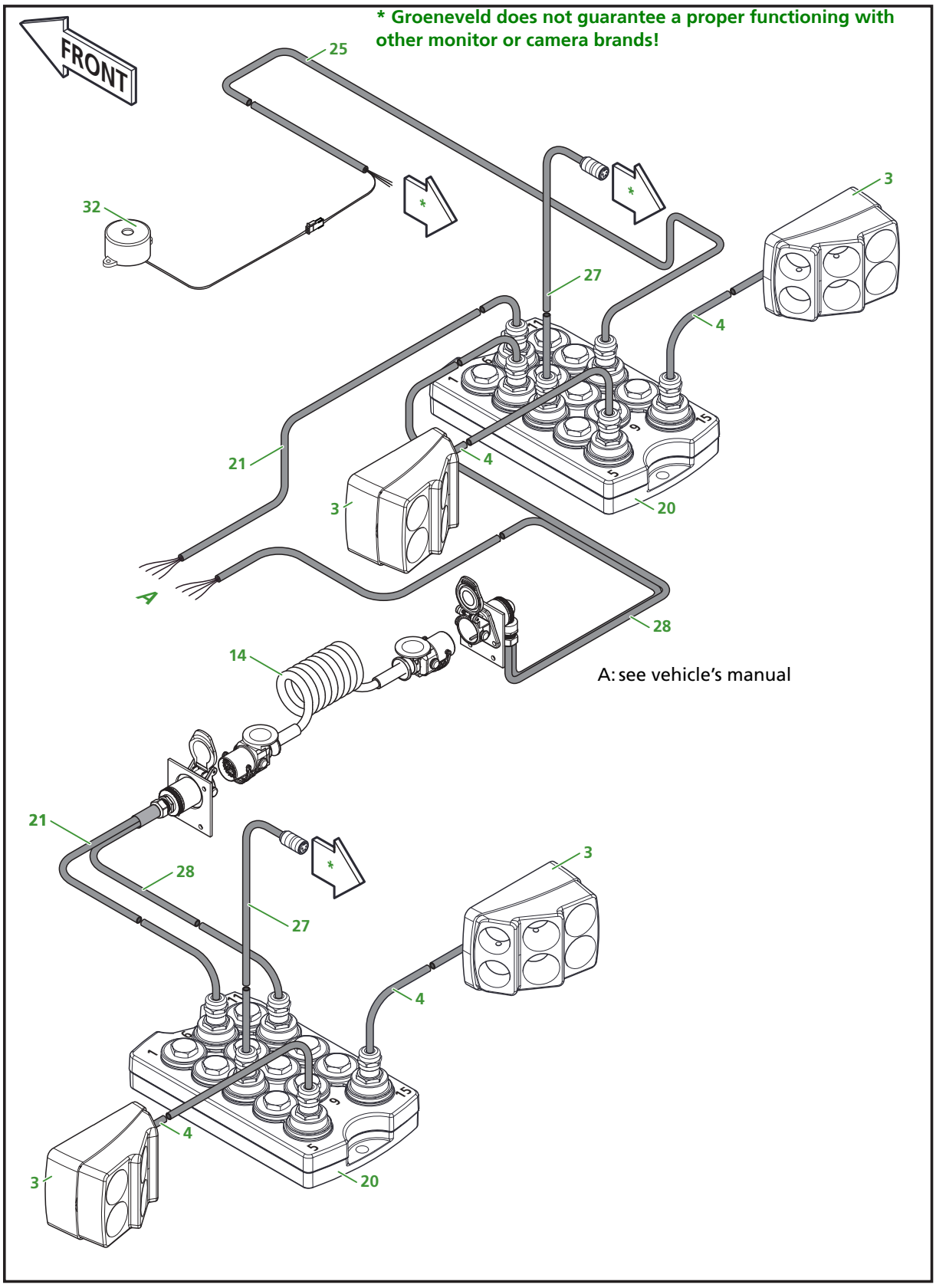
V28-GS2



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Parts list V28-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
14	Spiral cable	3.3	4.22
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
25	Monitor cable for other brand	-	4.13
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
32	Buzzer	-	4.14
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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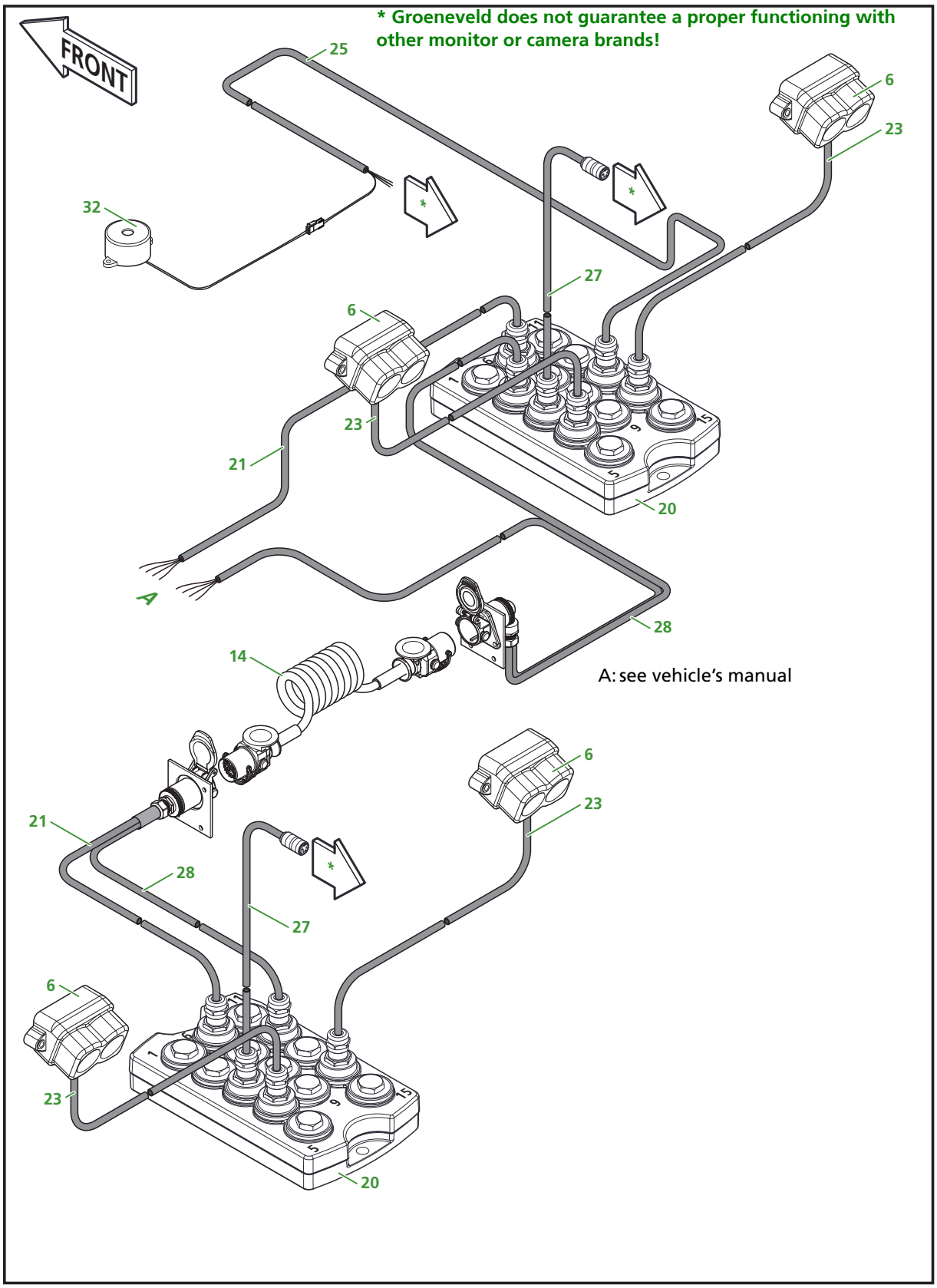
V29-GS2



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Parts list V29-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
6	Top/side sensor	3.2	4.6
14	Spiral cable	3.3	4.22
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable for other brand	-	4.13
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
32	Buzzer	-	4.14
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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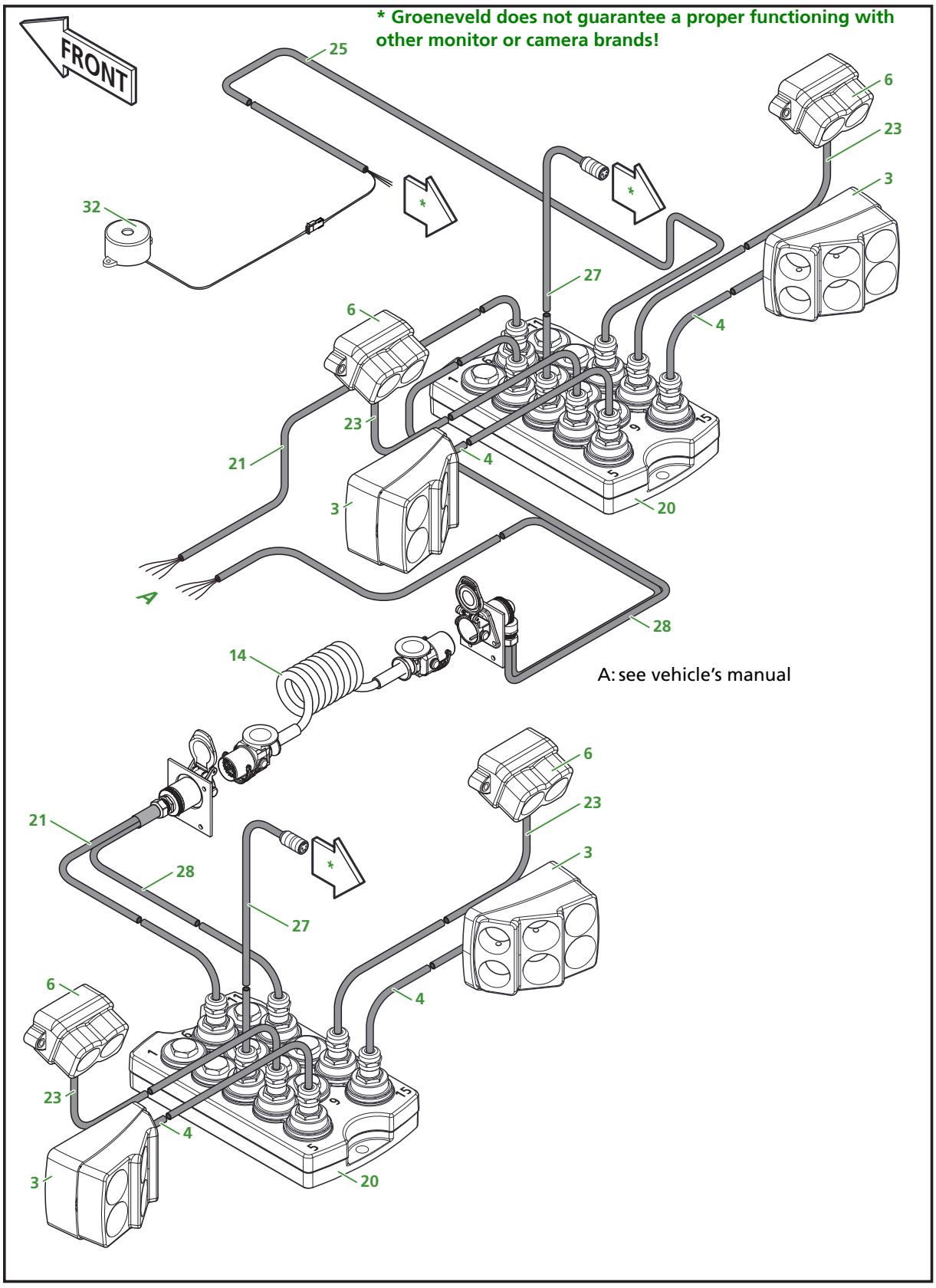
V30-GS2



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Parts list V30-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
14	Spiral cable	3.3	4.22
20	Control unit (VP included)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
25	Monitor cable for other brand	-	4.13
27	Camera cable (GS2)	-	4.5
28	Video CAN circuit cable	-	4.4
32	Buzzer	-	4.14
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
24	Signal supply cable	3.5	4.9
	Diagnosis cable	6.2	4.23

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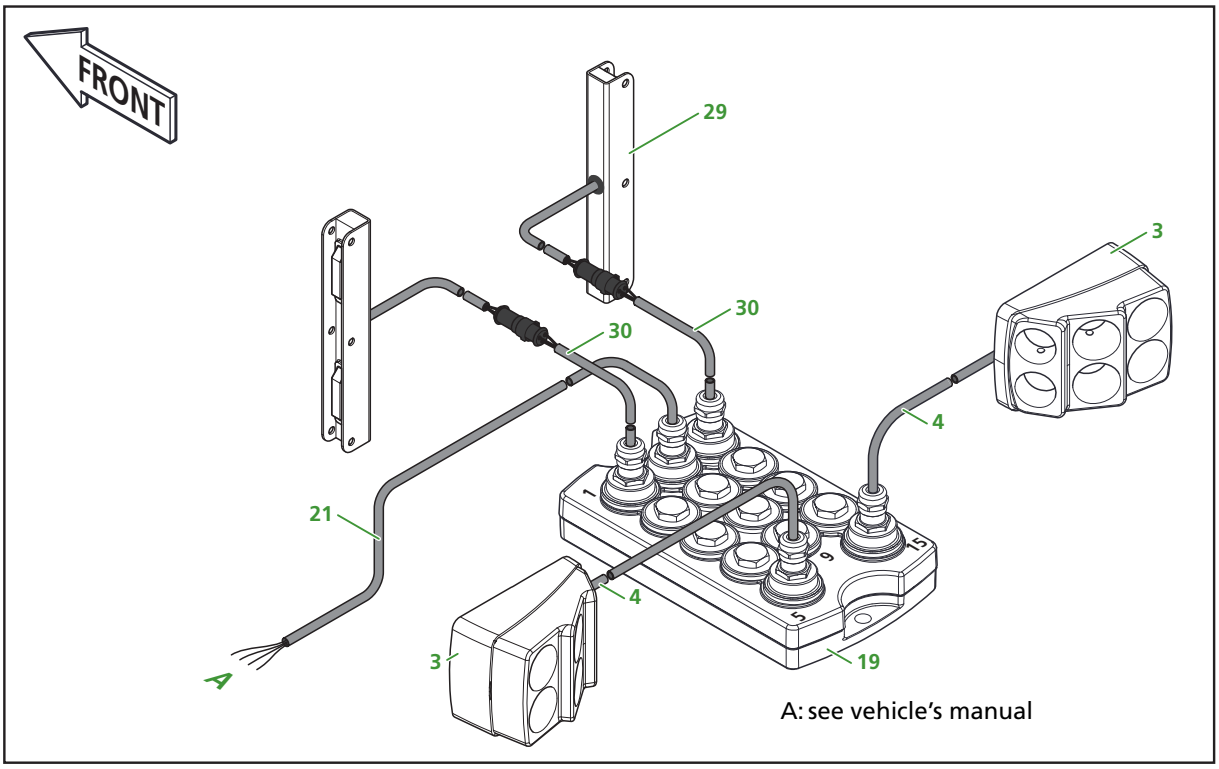
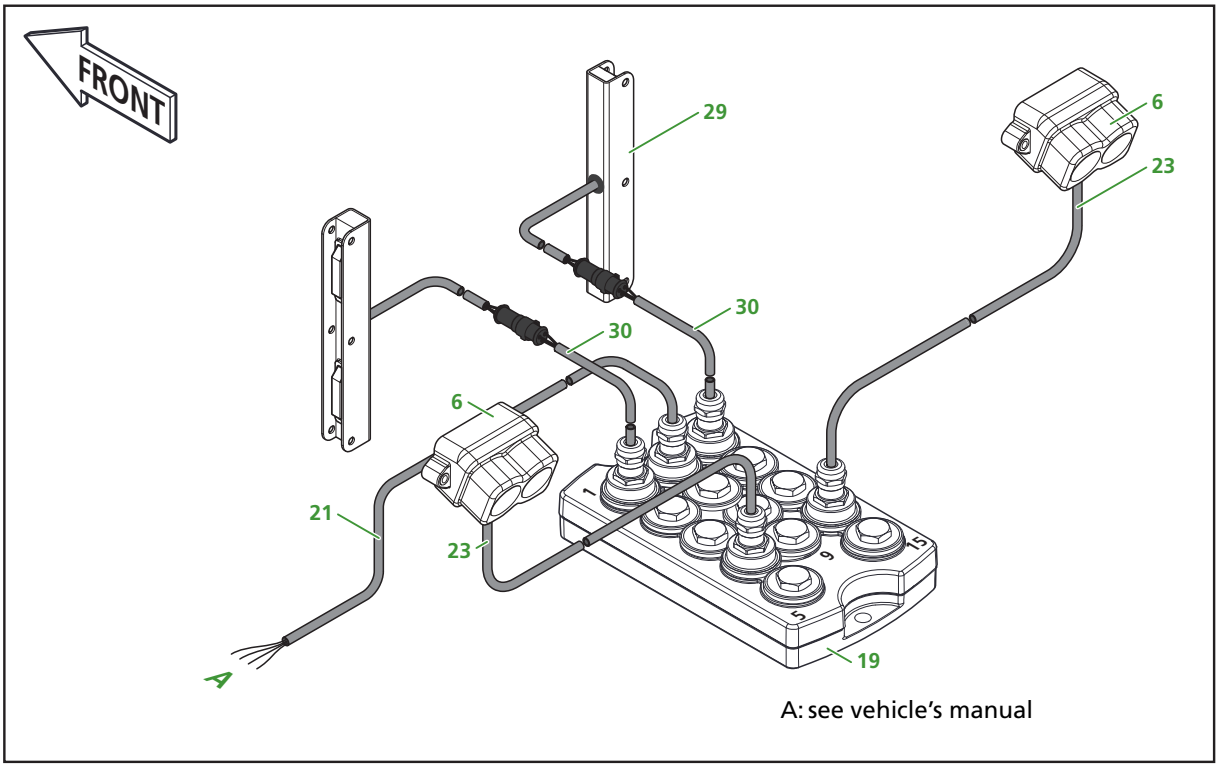
V31-GS2



V32-GS2



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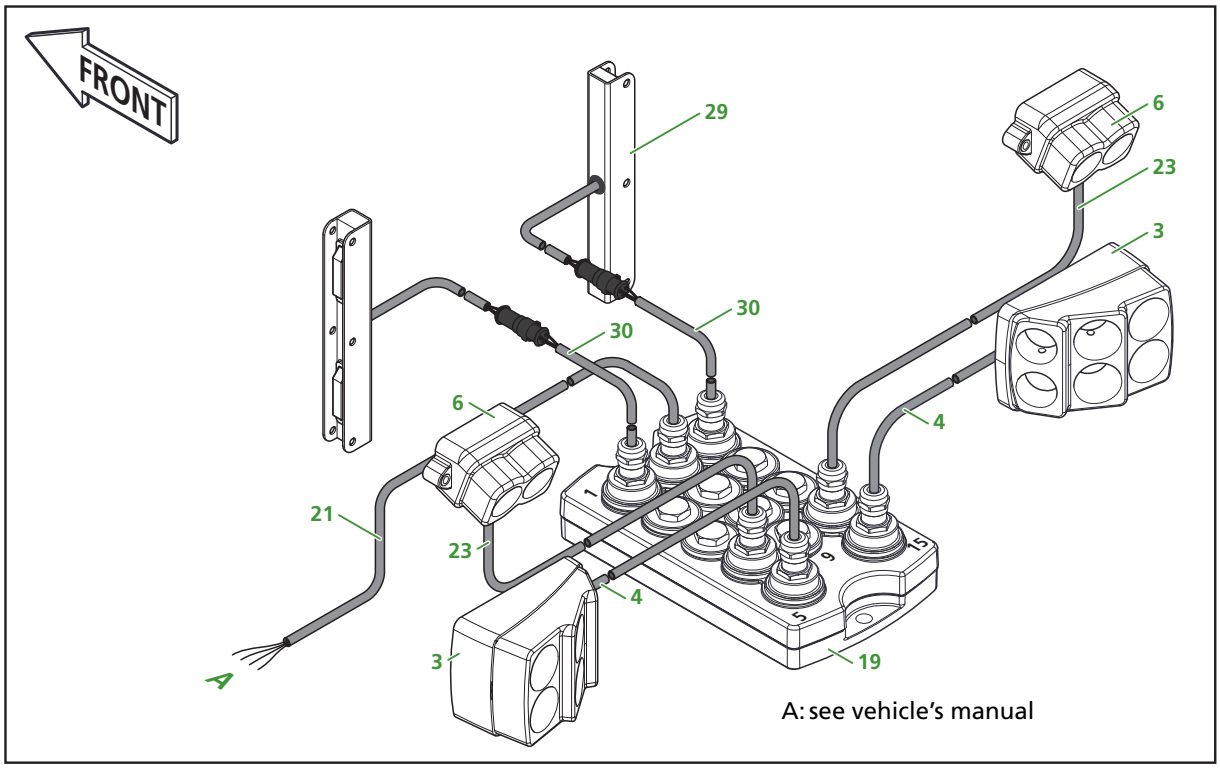
V33-GS2



Parts list V31-GS2, V32-GS2 and V33-GS2

Pos.	*Description*	*Installation*	*Wiring diagram*
3	Bottom sensor	3.2	4.21
4	Bottom sensor cable	-	4.21
6	Top/side sensor	3.2	4.6
19	Control unit (VP excluded)	3.1	4.1
21	Power cable 2-/3-wire	-	4.7/4.8
23	Top/side sensor cable	-	4.6
29	External lights cable	-	4.3
30	External lights	3.7	4.3
Available options			
12	Alarm horn	3.4	4.24
13	Alarm horn cable	3.4	4.24
	Diagnosis cable	6.2	4.23

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3. Installation

How to connect the wires and cables see chapter 4. Wiring diagrams.

3.1 Control unit and PG joints

The operation of the Greensight system is controlled by the control unit. Depending on the system configuration, some or all of the control unit outputs will be in use. If a certain control unit output is not being used, then it must be sealed with a sealing plug.
When a control unit output is in use, a PG gland is used to ensure that the lead is properly sealed. See Figure 3.1 and Figure 3.2 for an overview of the outputs of control unit GS2 and GS3 respectively.

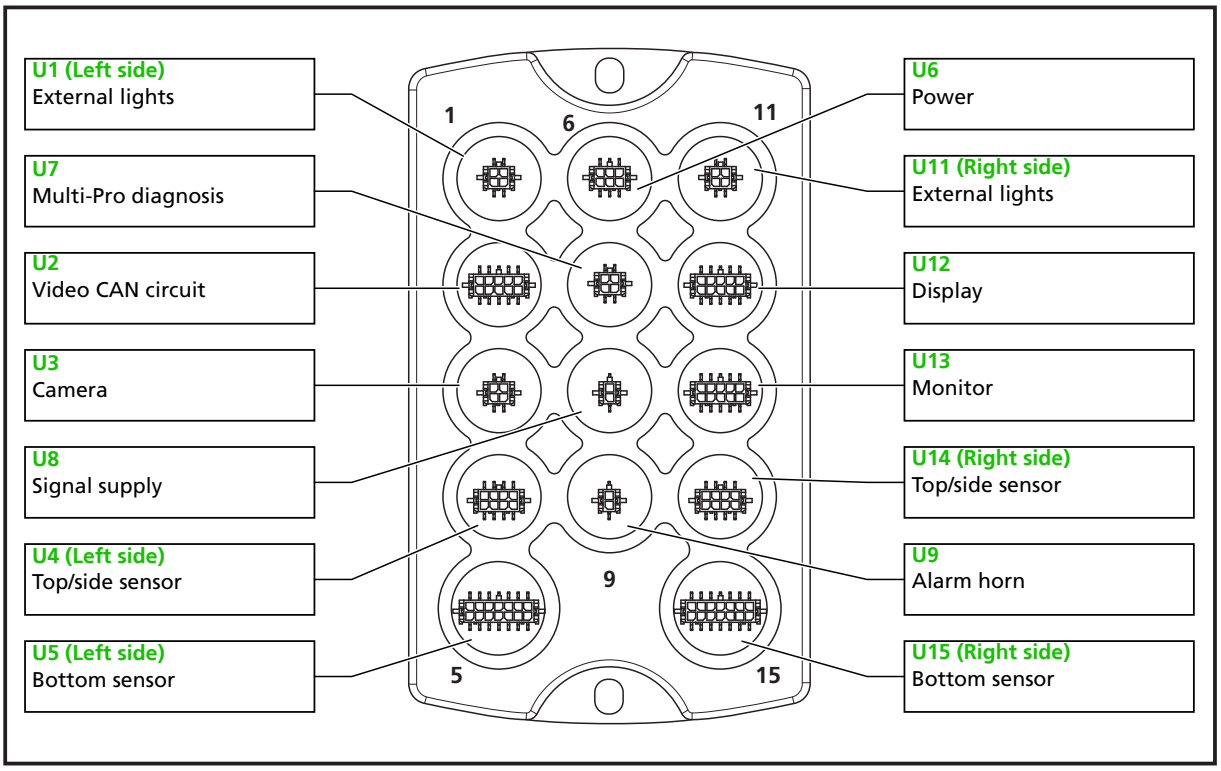

Figure 3.1 GS2 control unit outputs

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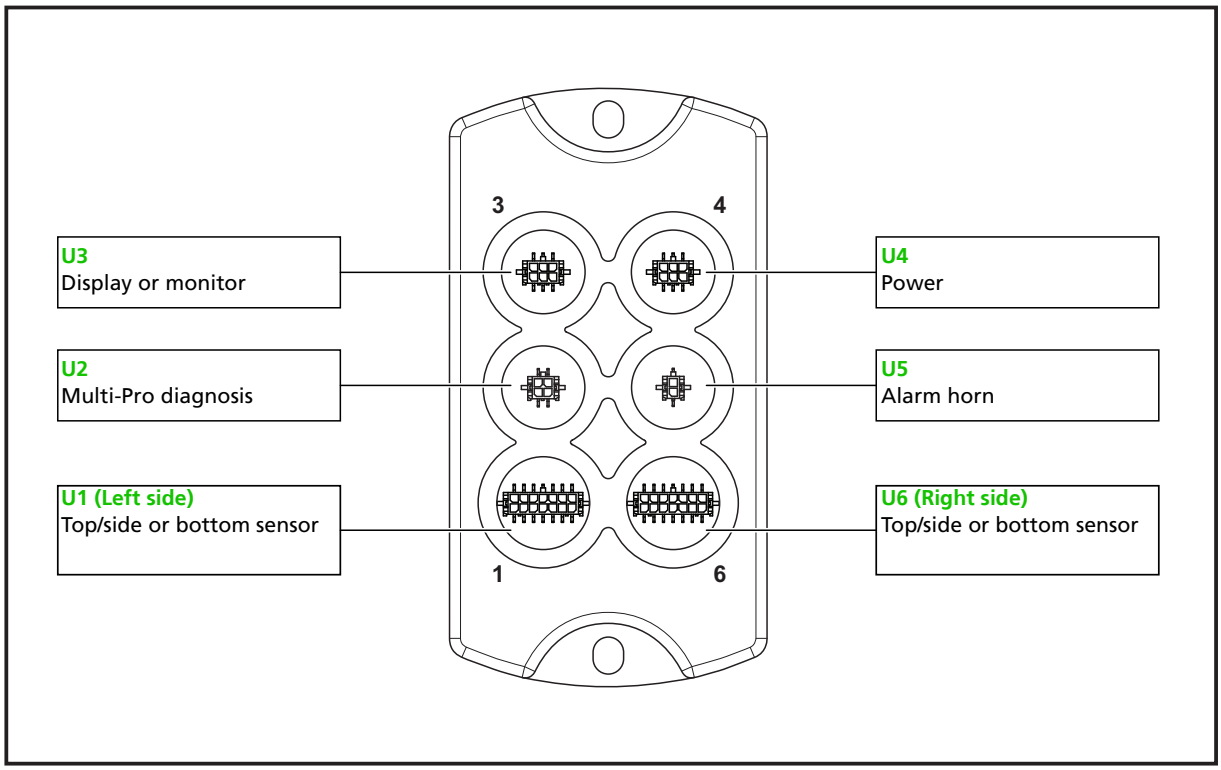

Figure 3.2 GS3 control unit outputs

Proceed as follows to position and mount the control unit:

1. When determining the position of the control unit, ensure that it will be well-protected, away from water splashed by the wheels or high-pressure cleaning equipment.
2. If at all possible, stay clear of places where high temperatures can be reached, such as the engine compartment.
3. Make sure there is sufficient room to connect the leads. After mounting, it must be possible to connect the communication cable of the Multi-Pro.
4. Do not allow the control unit to be subject to excessive vibrations, such as on an engine mount.
5. Drill the required mounting holes, and attach the control unit using the supplied mounting parts.
6. Remove the appropriate sealing plugs and make the electrical connections as shown in the wiring diagrams.
7. Fit the connectors using the PG glands as shown in Figure 3.3.

ATTENTION
To be sure of a long service life, it is essential to fit the PG glands in the correct way.

ATTENTION
The control unit must only be mounted in a vertical position.

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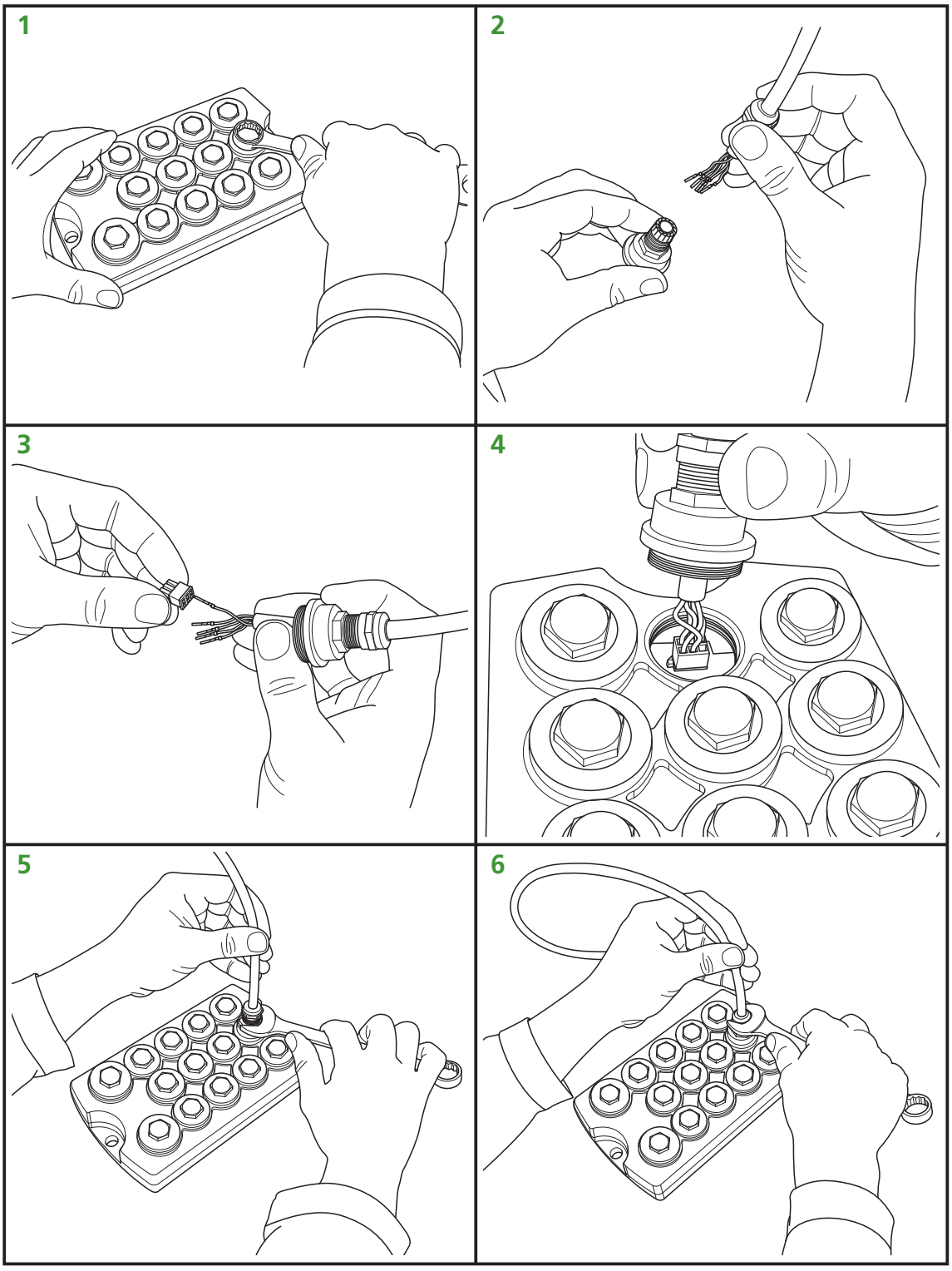

Figure 3.3 Fitting the PG gland

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3.2 Sensors

3.2.1 Positioning of sensors (under detection)

When positioning the sensors, ensure that they will not detect any protruding parts of the vehicle, such as an extended canopy, loading platform or step.
Mount the sensors in as well-protected a position as possible, to minimise the risk of damage and excessive contamination of these sensitive components. The illustration below shows the required clear area for the system to work correctly.

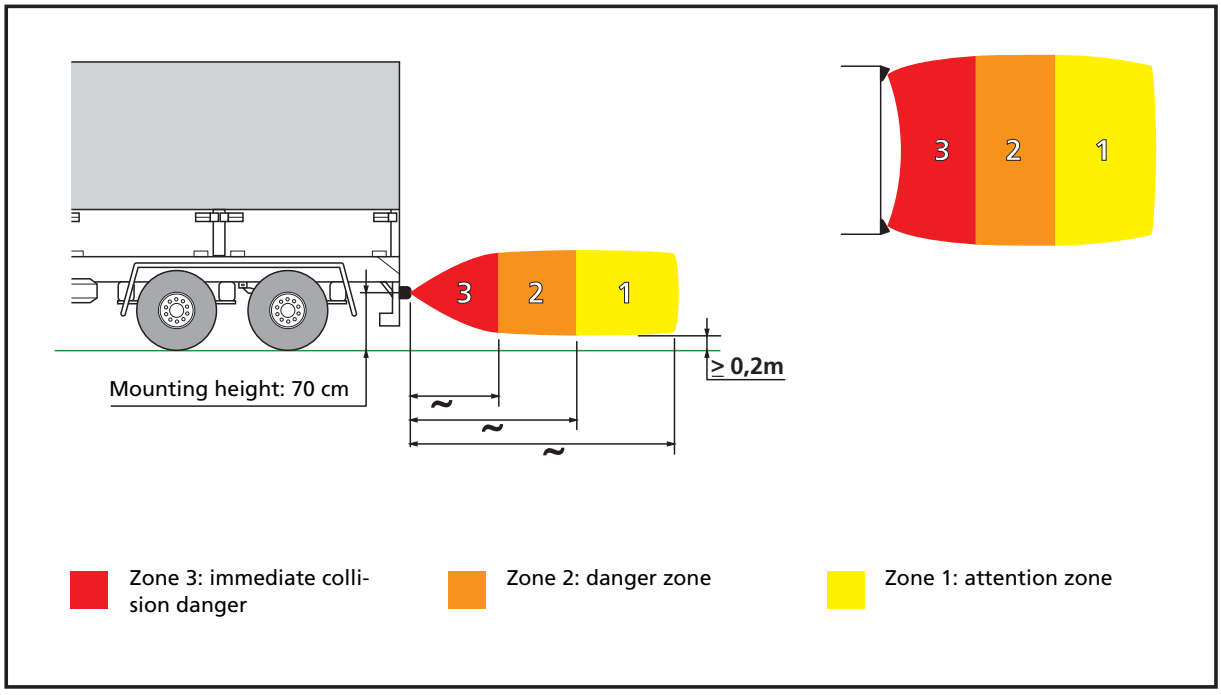

Figure 3.4 Diagram of the detection zones

Proceed as follows to establish the position of the sensors:

- Ensure that the sensors at the rear of the vehicle are installed as close as possible to, but within the side boundaries of the vehicle.
- Ensure that the sensors at the rear of the vehicle are installed as close as possible to, but within the rear boundary of the vehicle. Should this be impossible, then try to get as close as possible to this ideal position.
- The recommended mounting height for transport vehicles is 70 cm (heart of the sensor to the road surface), with the ground clearance of the detection area at 20 cm (see Figure 3.5).
  With wheel loaders, to ensure maximum protection, the sensors should be mounted on the counterweight. Depending on the vehicle, the mounting height may then vary between 70 and 120 cm (see Figure 3.6).

ATTENTION
The amount of ground clearance below the detection area is determined by the mounting height of the sensors. To avoid false alarm on the display, monitor or exterior lights, a minimum ground clearance of 20 cm is used.

WARNING
In the case of vehicles with a variable height, i.e. with leaf springs or lift axle, the height of the sensors can depend strongly on whether the vehicle is loaded or unloaded. Take account of this and ensure that the mounting height on the loaded vehicle is approximately 70 cm.

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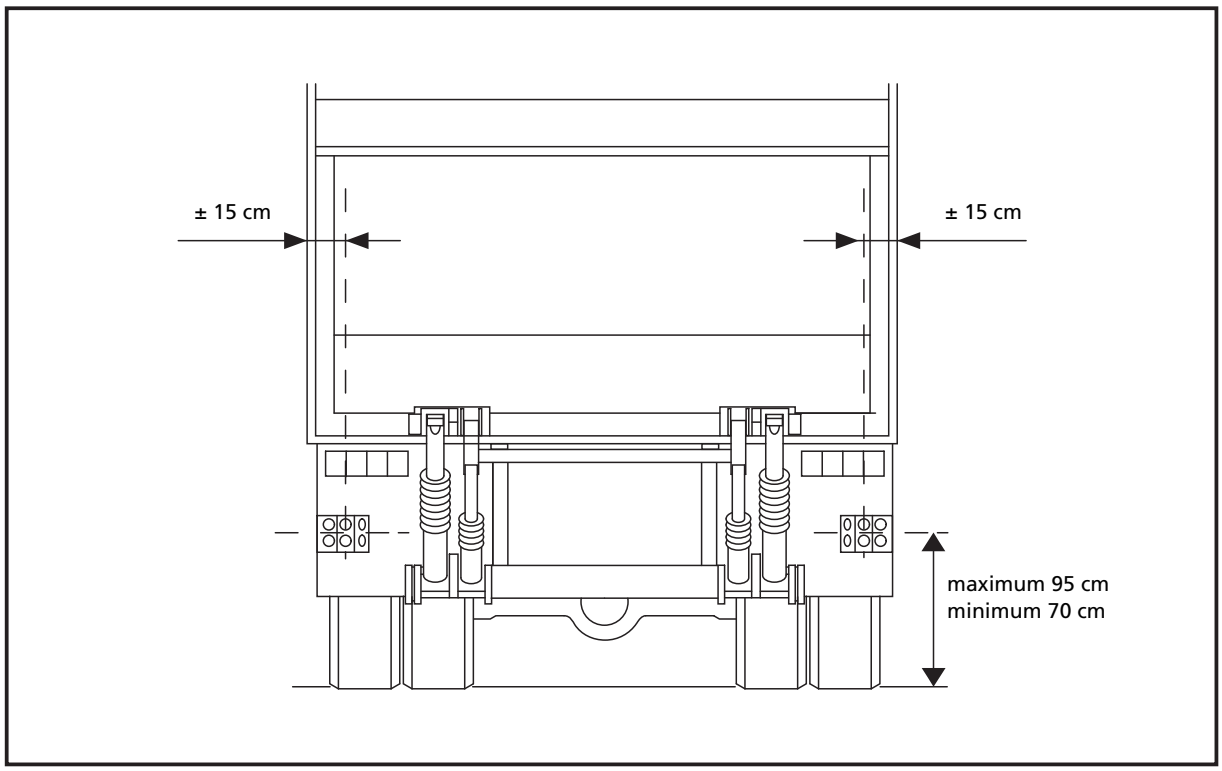

Figure 3.5 Position of sensors on a transport vehicle

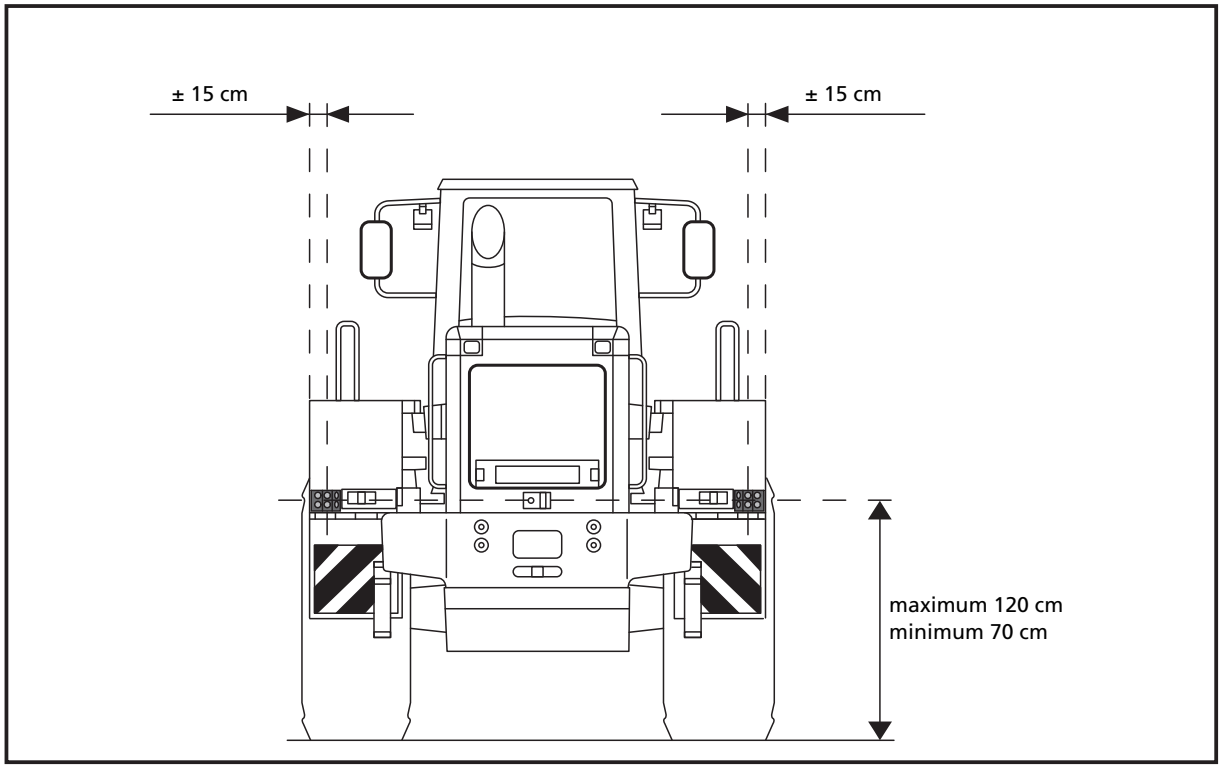

Figure 3.6 Position of sensors on a wheel loader

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3.2.2 Lower mounting heights

At mounting heights lower than 70 cm, special tilting plates must be used to ensure that the sensors are tilted backwards, within the available margins. This elevates the detection area and eliminates ground detection. The diagram below shows the heights at which specific tilting plates must be used.

Mounting heights	*Tilting plate*
65 cm	1.3°
60 cm	2.4°
50 cm	4.3°

ATTENTION
Avoid excessive tilting of the sensors, as this can cause water to accumulate in the units.

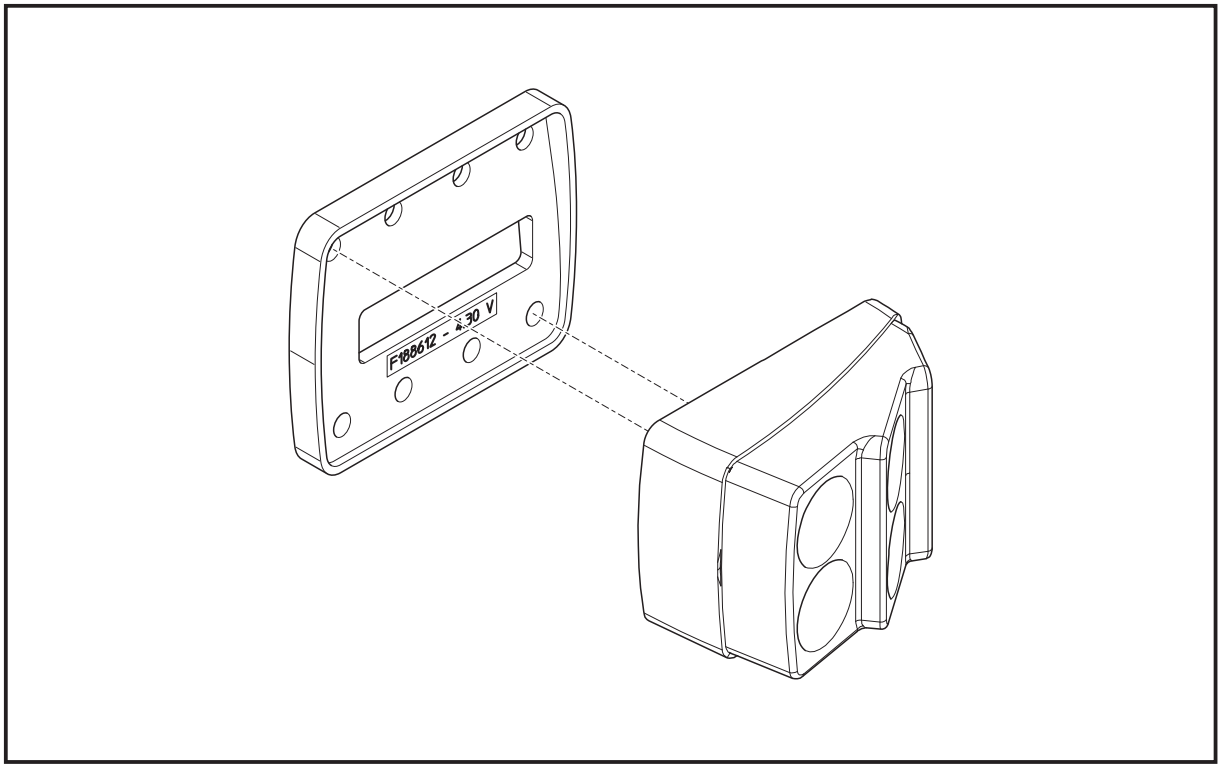

Figure 3.7 Tilting plate

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3.2.3 Install bottom sensors

To enable the sensors to be mounted with adequate protection and in the correct position, Groeneveld has several mounting brackets in its range of accessories. All bracket variants can be found on the technical support website.

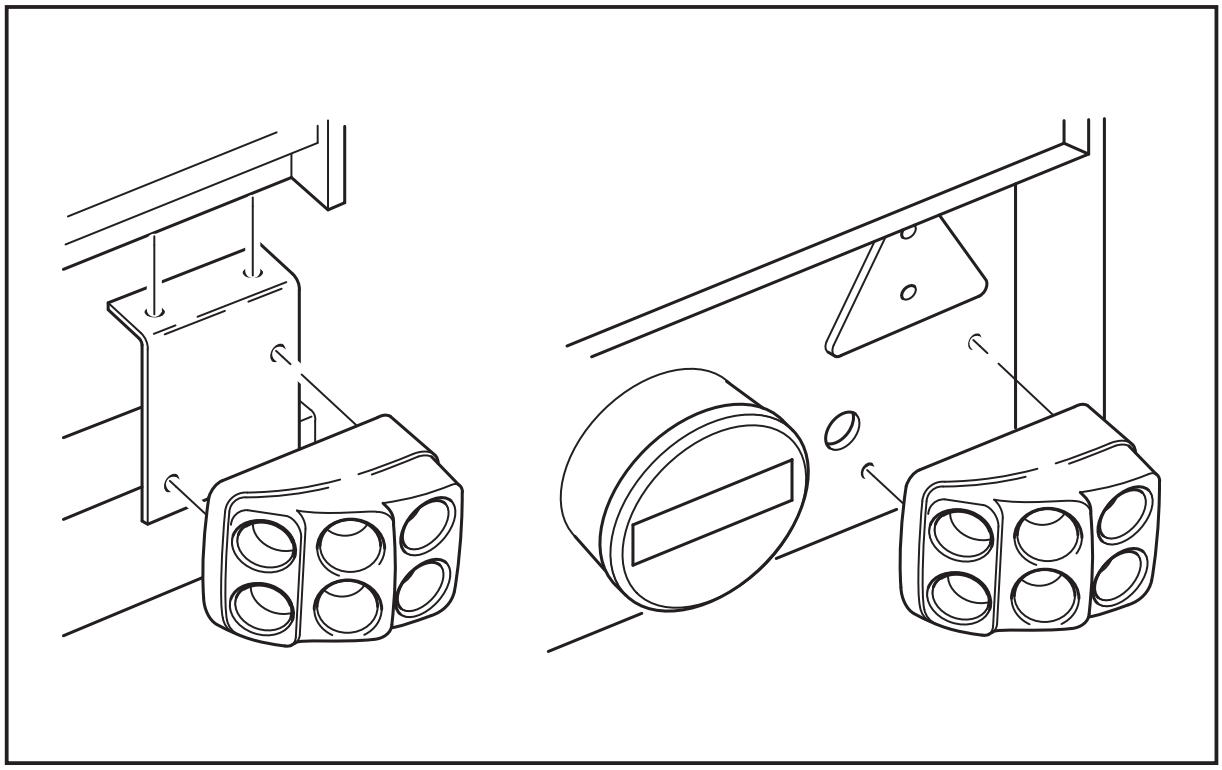

Figure 3.8 Mounting of the sensor with and without mounting bracket

WARNING
The maximum length of the threaded sockets in the sensor is 15 mm. Do not use excessively long bolts, otherwise the sensors could be seriously damaged.

Proceed as follows to mount the bottom sensors:

1. Prepare a suitable sensor mounting position as described in paragraph 3.2 Sensors and mount the sensor using correct fittings and technique. This will ensure problem-free operation and a long service life.
2. Starting at the control unit, feed the leads to the mounting position of the sensors.

ATTENTION
Ensure that you pull the correct leads for the sensor from the control unit to the left or right side of the vehicle.

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3. Remove the green protective caps from the connectors.
4. Check whether there is sufficient silicone grease on the connector rubbers, and apply additional silicone grease if necessary. However, avoid getting silicone grease inside the connector.
5. Plug the connectors into the sensor as shown in Figure 3.9, to avoid deforming the connector pins.
6. Attach the sensor using the supplied installation materials.
7. Route the leads alongside existing cables, making use of strips and/or wiring brackets.

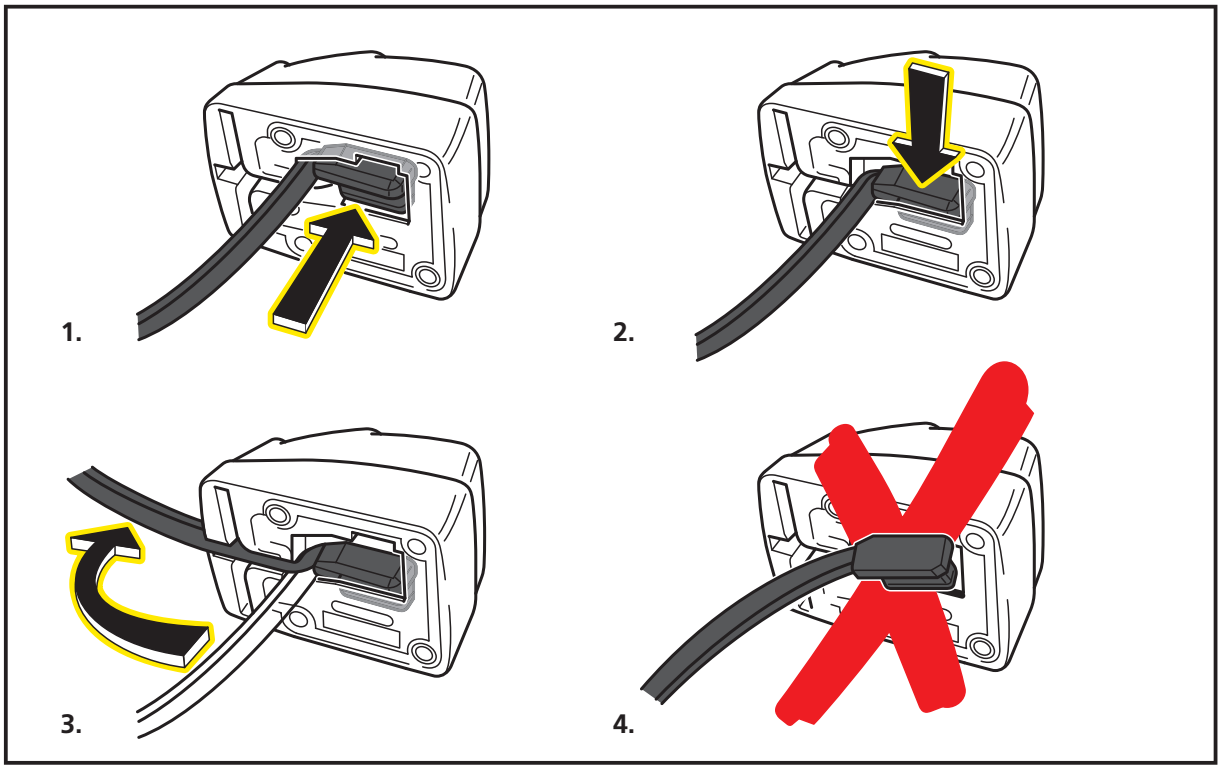

Figure 3.9 Fitting the connector to the sensor

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ATTENTION
If the detection zone exceeds 3 metres, the ground clearance will be reduced, and there will be a greater risk of ground detection. By slightly tilting the sensors backwards, the ground clearance can be increased to the required height. Groeneveld has special tilting plates for this purpose, that are also used when mounting the sensors at lower heights.

Avoid excessive tilting of the sensors, as this can cause water to accumulate.

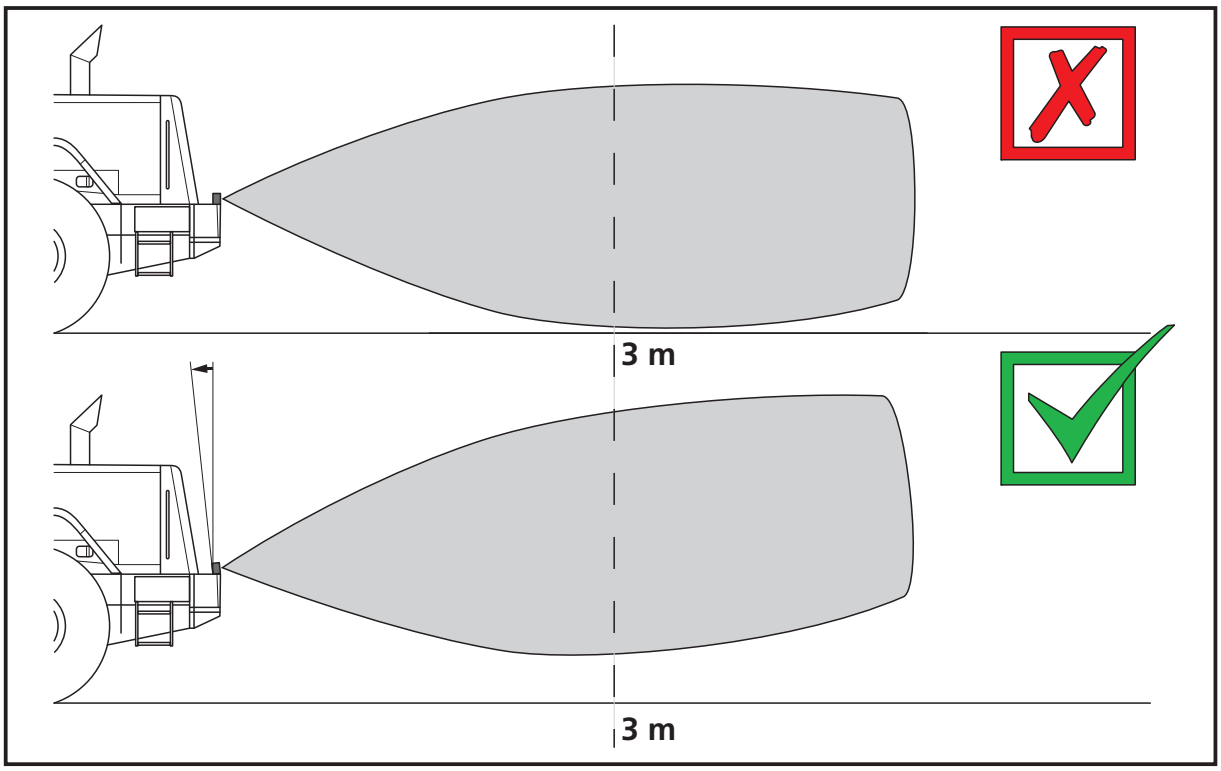

Figure 3.10 Tilting the sensors

3.2.4 Install Top/side sensors

Before the top/side sensors can be mounted, the mounting position first needs to be established. Take care that the sensors cannot detect any protruding parts of the vehicle, and also ensure that there are no restrictions on routing the lead to the control unit.

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Top detection (transport use)

Proceed as follows to mount the top sensors on a transport vehicle:

1. At the highest point on the rear end of the vehicle, determine where the sensors are to be mounted, avoiding if at all possible that the sensors protrude above the vehicle. Ensure that the sensors are mounted between 15 and 30 cm from the side of the vehicle (see Figure 3.11).

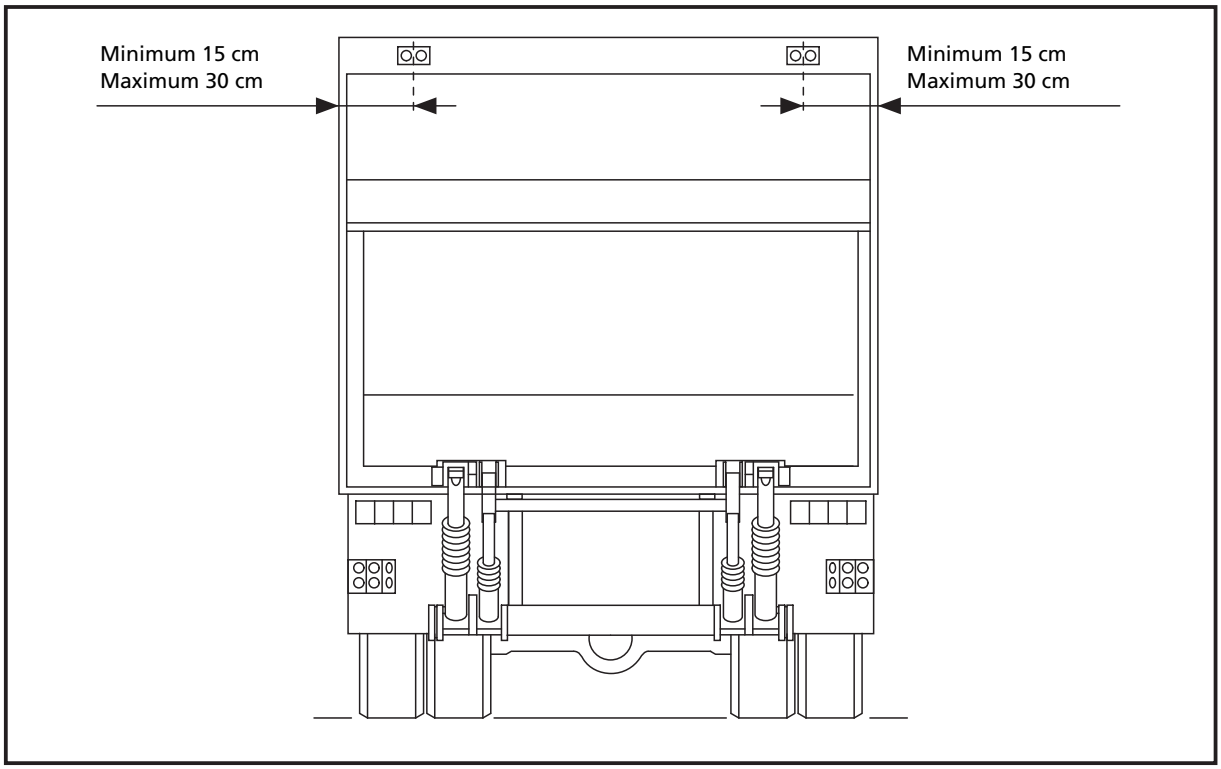

Figure 3.11 Position of the top sensors on a transport vehicle

2. Drill the required lead routing and mounting holes.
3. Feed the leads through the post from the top down.

ATTENTION
Take care to avoid sharp edges, burrs and other sharp parts that can damage the leads.

4. Remove the green protective caps from the connectors.
5. Check whether there is sufficient silicone grease on the connector rubbers, and apply additional silicone grease if necessary. However, avoid getting silicone grease inside the connector.
6. Plug the connectors into the sensors as shown in Figure 3.12, to avoid deforming the connector pins.

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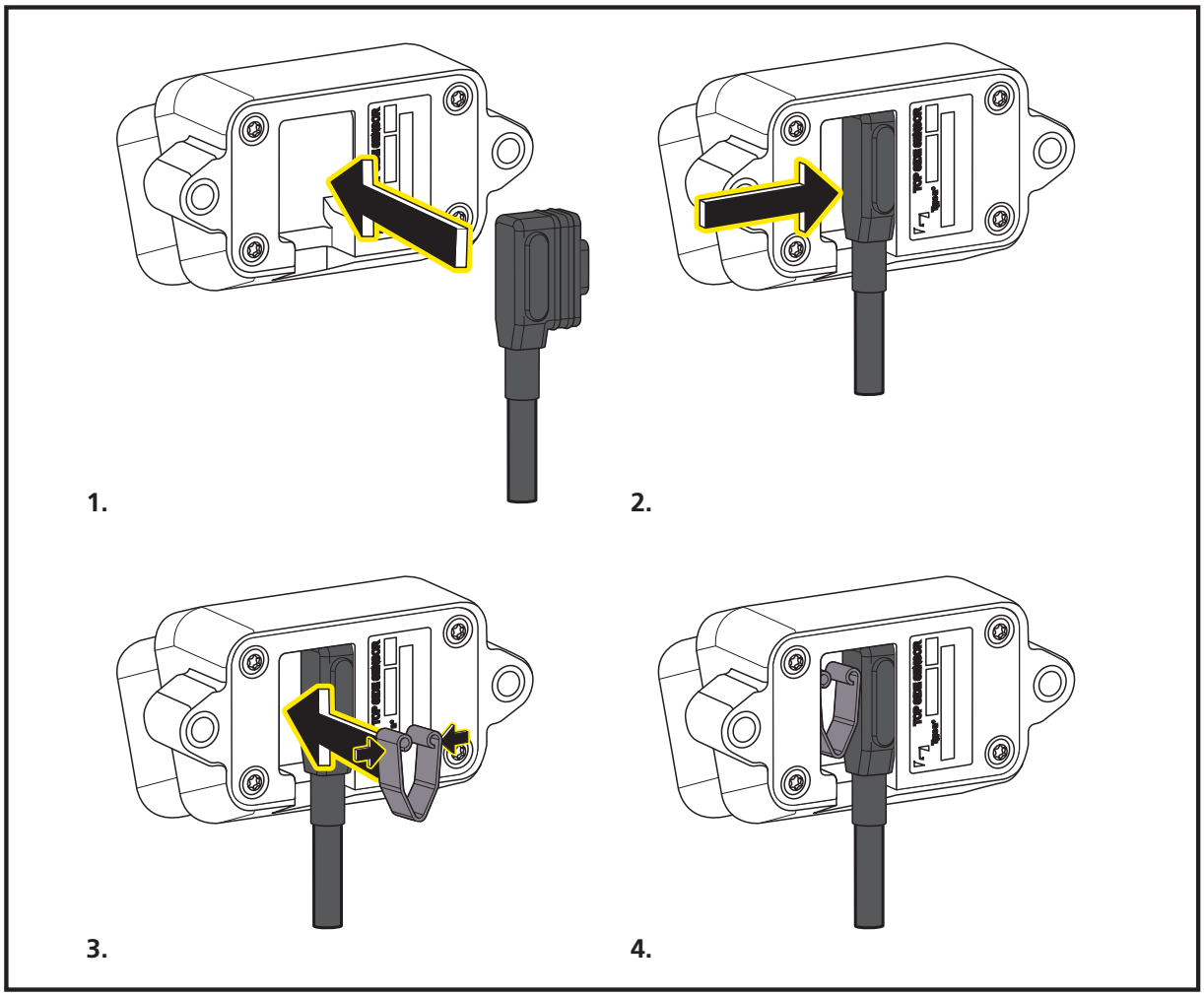

Figure 3.12 Fitting the connector to a top/side sensor

7. Attach the sensors using the supplied installation materials.
8. Connect the sensor leads to the control unit, as described in the wiring diagrams.
9. Route the leads alongside existing cables, making use of strips and/or wiring brackets.

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Side detection (transport use)

Side detection has been developed to monitor the rearmost section of articulated lorries while negotiating corners. Greensight side detection can only be effective when driving at walking speed, and should be regarded as an active aid for manoeuvring. The side detection sensors are active as soon as the ignition is switched on, and are switched off as soon as the preset speed is reached. The switching-off of the side detection may be achieved by means of a + signal (e.g. from the ABS system) or by the pulse signal from the tachograph.
The required detection field and the speed range can each be programmed using Multi-Pro software. The Multi-Pro can also be used to choose whether the side detection should function when driving straight ahead and/or in reverse.
The sensors used for side detection are identical to the top sensors. By default the detection area is divided into three zones, but "red only" can also be programmed using Multi-Pro. This function enables detected objects to be immediately signaled with "red".
For further information about Multi-Pro software see chapter 5. Calibration and 6. Multi-Pro software.

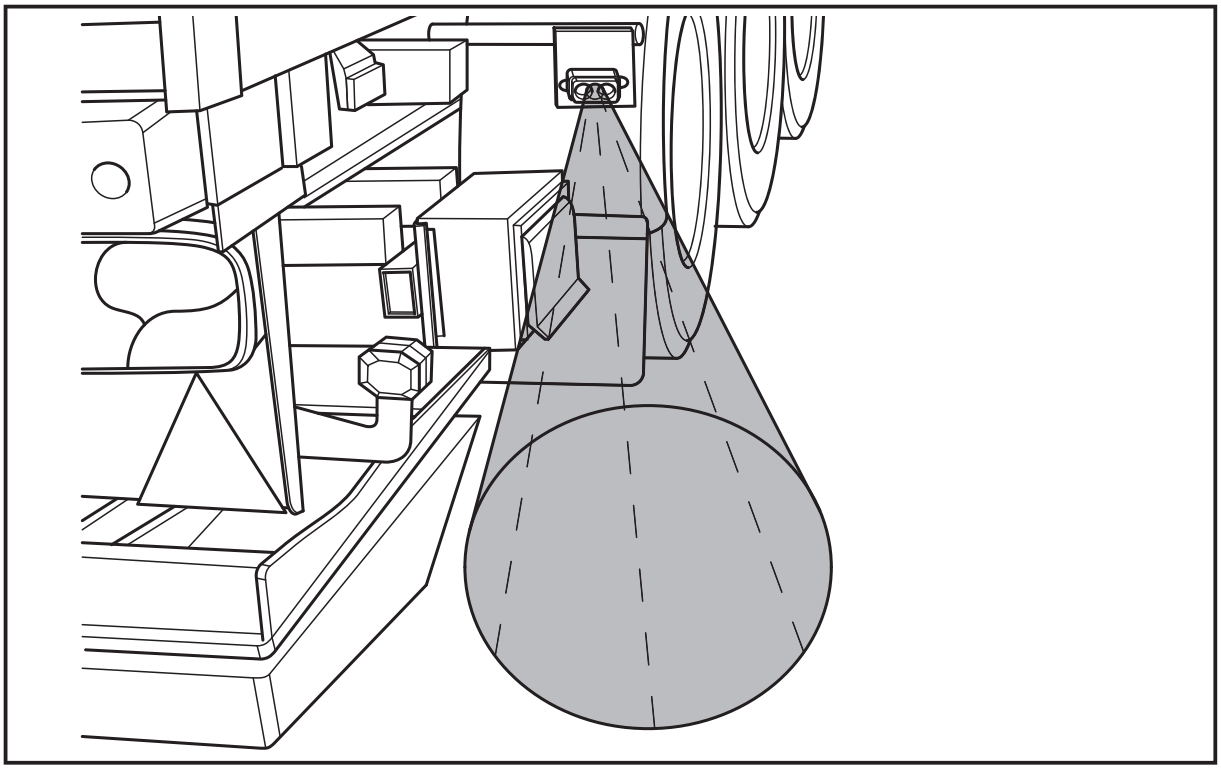

Figure 3.13 Side detection

Proceed as follows to establish the position of the side sensors:

1. Ensure that the side sensors are mounted in a protected position, safe from water splashed by the wheels.
2. The side sensors must be directed towards the rear of the trailer, and may not protrude outside the trailer.
3. Make certain that the detection cone of the sensor does not detect protruding parts of the vehicle.
4. Ensure that the position of the sensor and the length of the detection area allow sufficient adjustment in order to achieve the required detection area. Figure 3.14 shows the detection cone with the length axis as variable.

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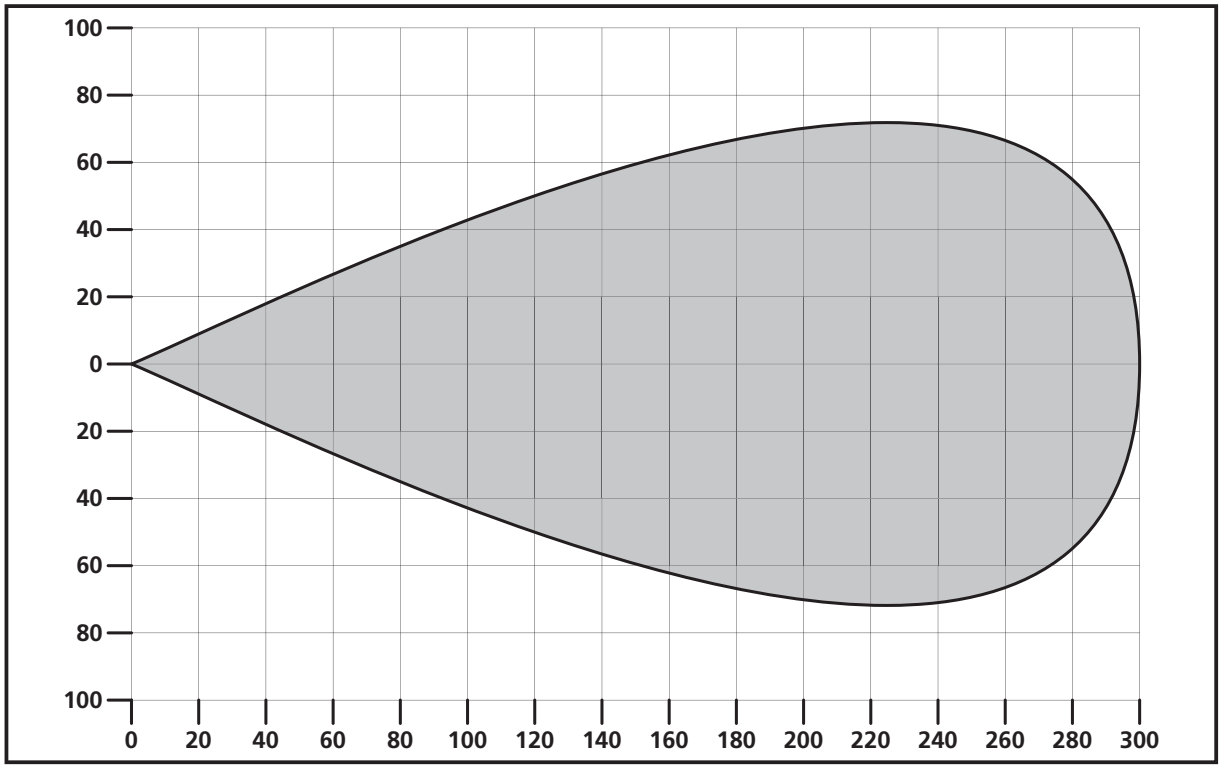

Figure 3.14 Detection cone

Proceed as follows to mount the side sensors:

1. To limit the effect of vibrations on the sensors, ensure that the mounting-point of the sensors is solid.
2. Connect the sensor leads to the control unit, as shown in the wiring diagrams.
3. Route the leads alongside existing cables, making use of strips and/or wiring brackets.
4. Connect the leads for activating the side detection function as shown in the wiring diagrams.

3.2.5 Top detection (off-road use)

To achieve a more complete detection field for off-road vehicles, top sensors can be added. Groeneveld recommends adding this option when the mounting height of the bottom sensors is higher than 120 cm.
In this configuration, the top sensors are aimed diagonally downwards at the boundary between zones 2 and 3, with the aid of special pivoting supports. By default, the detection area of the top/side sensors is divided into three zones, but “red only” can also be programmed with the aid of Multi-Pro software. Using this function, detected objects are immediately signaled with “red”.
For further information about Multi-Pro software see chapter 5. Calibration and 6. Multi-Pro software.

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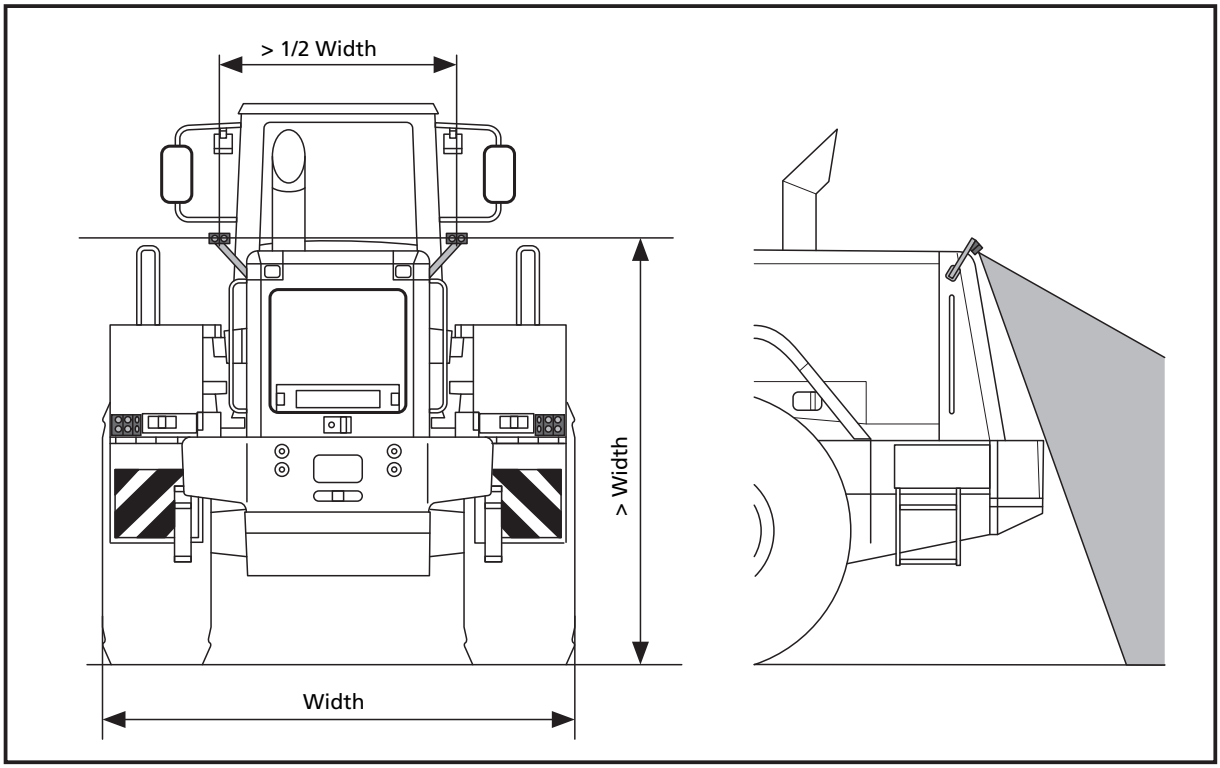

Figure 3.15 Position of the top sensors

Proceed as follows to install the top sensors:

1. Establish the position of the sensors. To limit the effect of vibrations on the sensors, ensure that the mounting-point of the pivoting supports is solid.
2. Try to obtain a mounting height for the sensors that is at least equal to the width of the vehicle.
3. Ensure that the width between the two sensors is at least half the width of the vehicle.
4. Adjust the downward-aiming sensors to achieve the required detection zone. This requires deactivating the bottom sensors by placing a piece of sponge in the cones of the sensors.
5. Route the leads alongside existing cables, making use of strips and/or wiring brackets.

3.3 Rigid/trailer system circuit

When a rigid/trailer combination is equipped with Greensight, the rigid system must be switched off when the trailer is hooked up. At the same time, the signals from the trailer must be displayed on the signalling unit in the cab.
This switching between two Greensight systems is enabled by installing a switching cable between both control units (see 4.1 GS2 Control unit and 4.4 GS2 Video CAN circuit cable (combined systems)).

3.3.1 Connections for articulated vehicles

To enable Greensight to provide signalling and system control on articulated vehicles, Groeneveld has various connection variants in its product range to span the articulated section. One example is a spiral cable or a direct plugged connection between the two articulated sections. Paragraph 4.22 GS Straight/spiral cable contains an explanation of the alternative ways these connections can be installed.

Proceed as follows to install the spiral cable:

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1. Feed the cable through the plug connection.
2. Fill the steel connection pins with tin using a soldering iron (see Figure 3.16/1).
3. Solder the leads to the steel connection pins (see Figure 3.16/2).
4. Press the connection pins into the connector as shown in the wiring diagrams.
5. Fit a strip around the cable (see Figure 3.16/3)
6. Mount the connector body on the mounting bracket (see Figure 3.16/4).
7. Fit the connector to the connector body and firmly tighten the PG gland (see Figure 3.16/4).

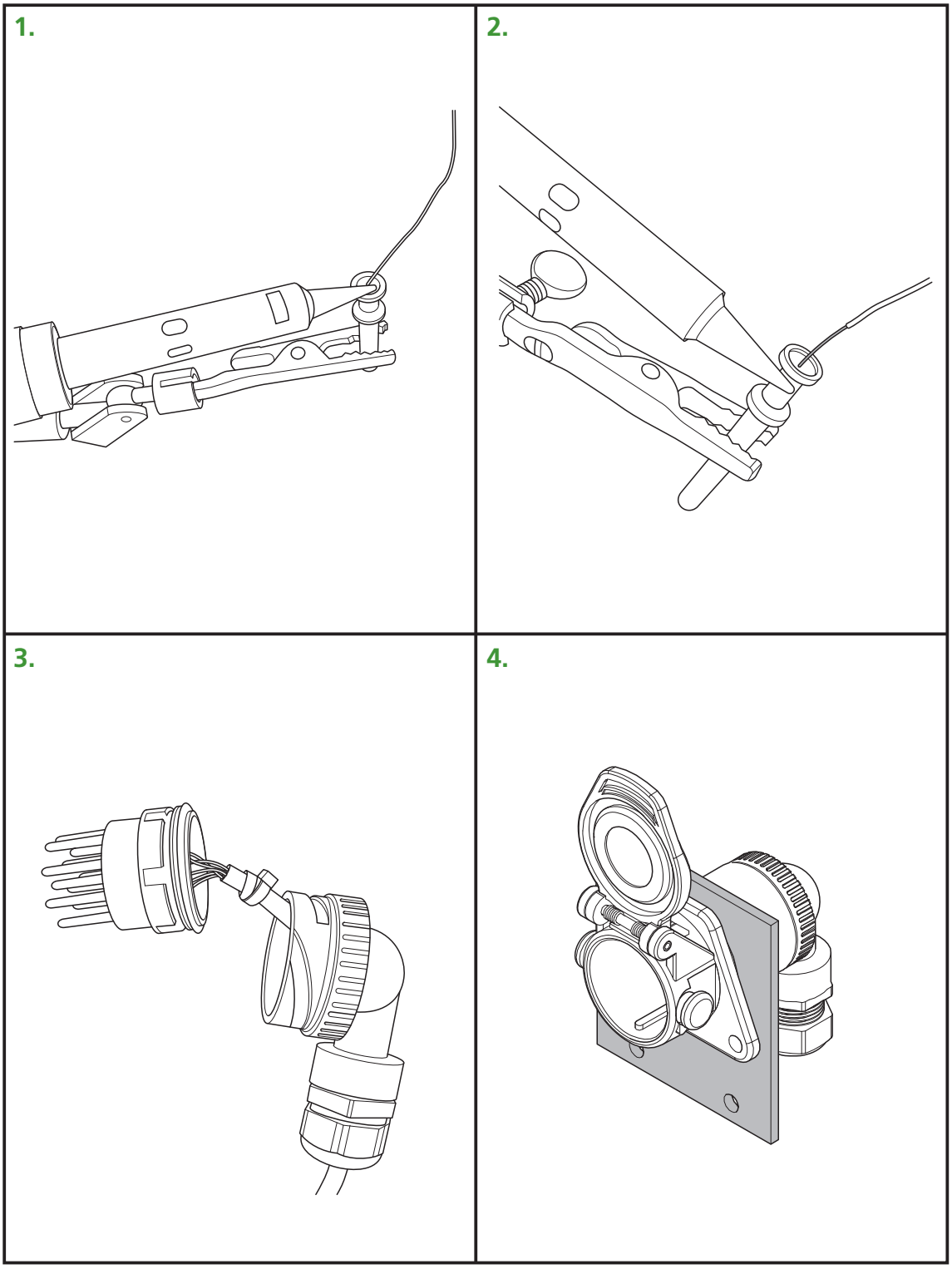

Figure 3.16 Installation of the spiral cable

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3.4 Alarm horn

The alarm horn is intended to warn persons who may be present within the detection area behind the vehicle. The alarm horn is activated as soon as an object is detected. The loudness of the sound produced will increase with the level of ambient noise.

Proceed as follows to mount the alarm horn:

1. Select a position for the alarm horn such that it is out of sight, and as far as possible to the rear of the vehicle.
2. Ensure that the horn faces to the rear of the vehicle, and points diagonally downwards.
3. Make sure there is sufficient length in the lead from the control unit.
4. Mount the alarm horn using the supplied installation materials.

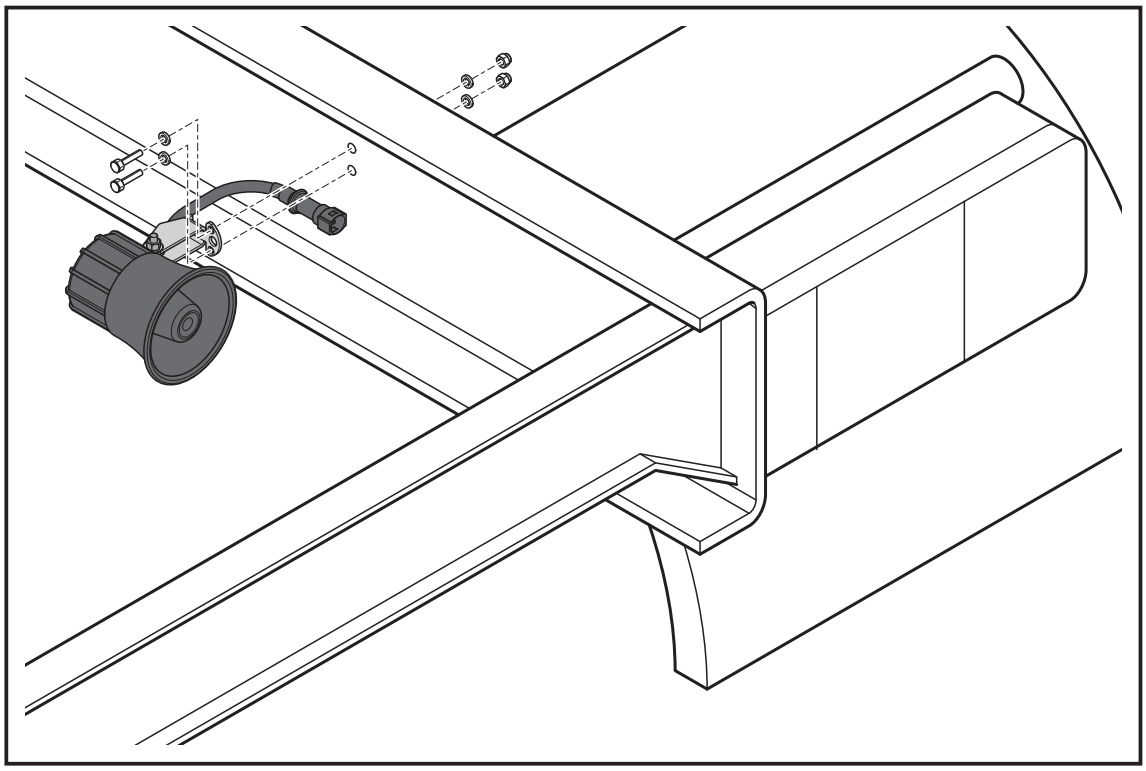

Figure 3.17 Alarm horn

3.5 Signal supply function

Greensight can optionally be extended with the “signal supply” function, which supplies a plus signal on control unit output U8 as soon as an object is detected in detection zone 3. This is useful for switching on an additional powered warning device, such as an extra horn or a warning light. The plus signal that cuts off the instant the object disappears from the furthest zone, is identical to the control voltage on the control unit.

WARNING
Groeneveld accepts no liability whatsoever for any damage that may arise due to the use of the Greensight system to activate an automatic braking system.

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3.6 Cameras

3.6.1 Reverse camera

To enable the active camera detection system functionality, a camera must be mounted on the rear of the vehicle. The camera is connected by a plug-connector to the lead from terminal U3 of the GS2 control unit.
Before the camera can be mounted, the mounting position first needs to be established.

ATTENTION
Ensure that the camera is not mounted behind protruding parts of the vehicle, and that it is possible to route the lead from this point to the control unit.

Proceed as follows to mount the camera:

1. Select the mounting position for the camera at the highest and most central point on the rear of the vehicle (see also Figure 3.18).

ATTENTION
Make sure the camera does not protrude above the vehicle.

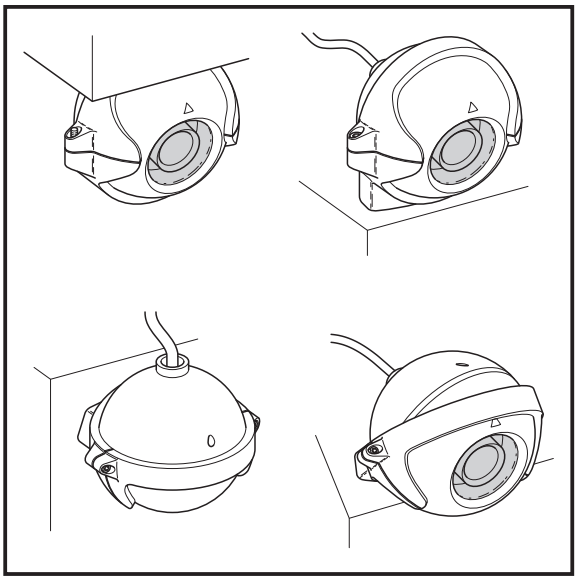

Figure 3.18 Camera position

2. Drill the required lead routing and mounting holes (see Figure 3.19).

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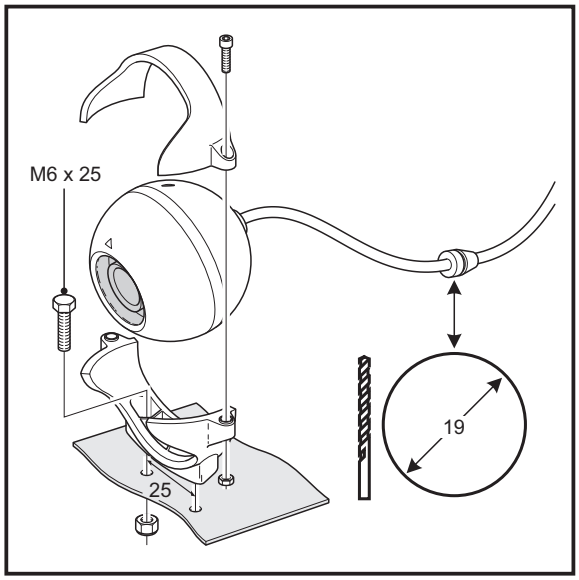

Figure 3.19 Lead routing and mounting holes

3. Feed the leads through the post from the top down.

ATTENTION
Take care to prevent the leads from being damaged by sharp edges, burrs and other sharp parts.

4. Attach the camera using the supplied installation materials.
5. Connect the camera to the control unit, as shown in the wiring diagrams.
6. Route the lead alongside existing cables, making use of strips and/or wiring brackets.
7. Adjust the field of view of the camera (see Figure 3.20).

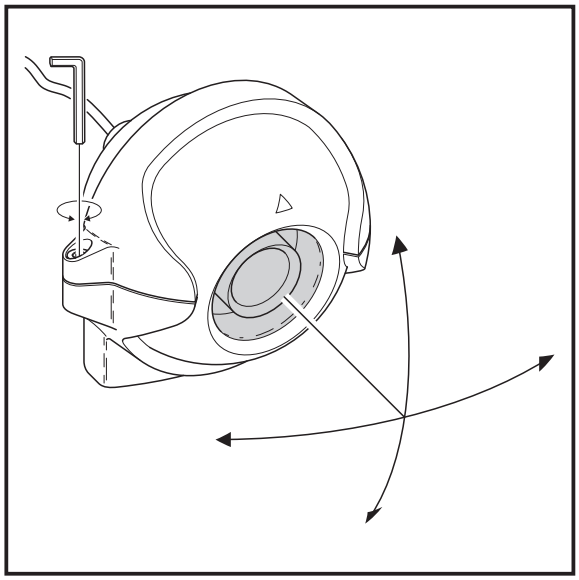

Figure 3.20 Camera adjustment

3.6.2 Front view side camera

Greensight is already prepared for the connection of an additional camera in compliance with the new 2005/27/EC mirror directive. Another useful application for the extra camera is making the blind spot visible.

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The camera is connected directly to the monitor and is activated by an appropriate control signal.

Proceed as follows to mount the extra camera:

1. Select a position for the camera such that it covers the required field of view. Ensure that the camera is not mounted behind protruding parts of the vehicle, and that it is possible to route the lead from this point to the monitor.
2. Drill the required lead routing and mounting holes (see Figure 3.20).
3. Route the lead from the camera to the monitor.

ATTENTION
Take care to prevent the leads from being damaged by sharp edges, burrs and other sharp parts.

4. Attach the camera using the supplied installation materials.
5. Connect the camera to the monitor, as shown in the wiring diagrams.
6. Route the lead alongside existing cables, making use of strips and/or wiring brackets.
7. Adjust the field of view of the camera (see Figure 3.20).

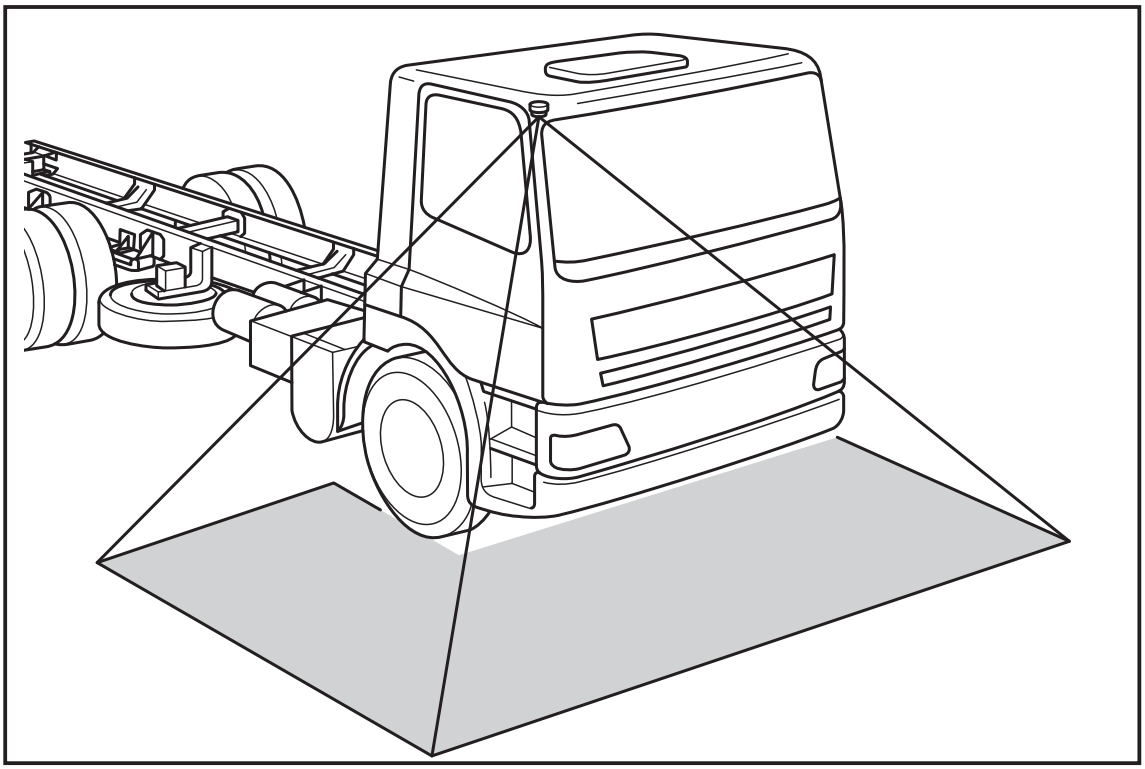

Figure 3.21 Field of view of front view side camera

3.7 External lights

When Greensight is used on trailers, it is also possible to use external lights mounted on the trailer itself in the field of view of the side mirrors.
The advantage of this configuration is that the complete system is then installed on the trailer, allowing it to function independently of the lorry.

Proceed as follows to mount the external lights:

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1. Select a position for the external lights on the left and right side of the trailer such that they are within the viewing angle of the side mirrors, and are therefore easy for the driver to see.
2. Bear in mind the maximum possible length of the leads from the control unit. If there is excessive length in the leads, trim them at the control unit end.
3. Avoid positioning the external lights such that they protrude beyond outside the vehicle.
4. You may then mount the external lights using the supplied installation materials.

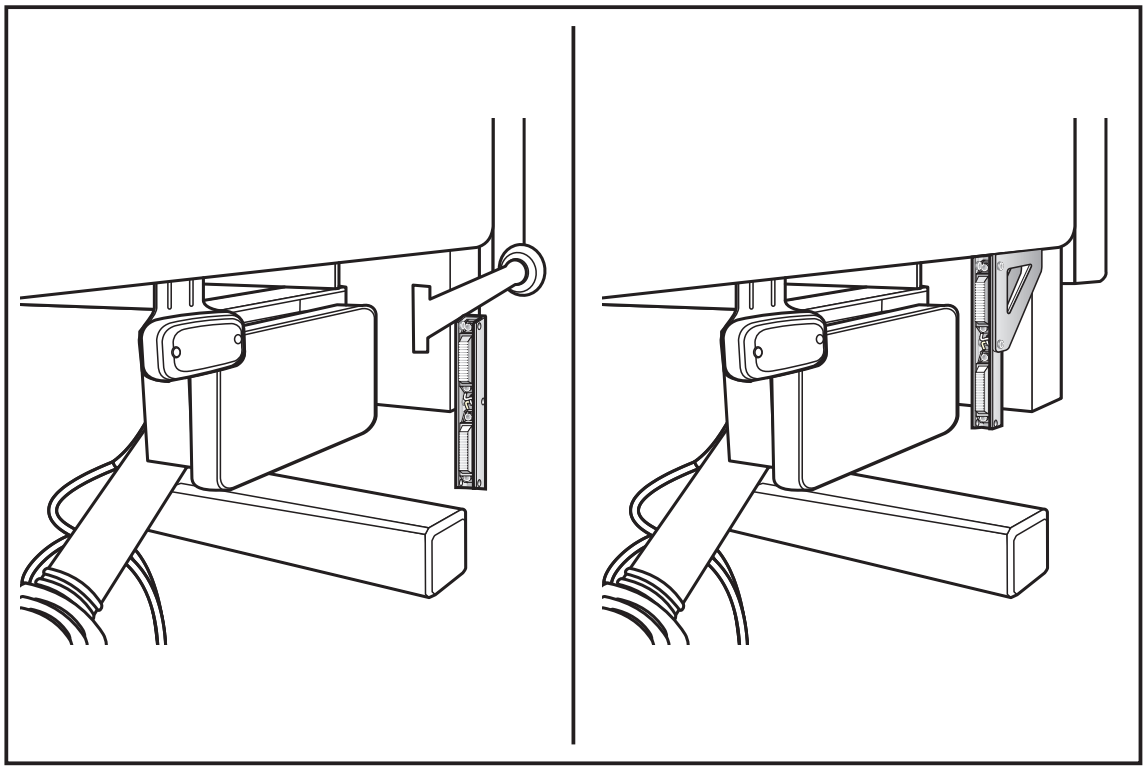

Figure 3.22 External lights

3.8 In-cab display

Greensight is also available in a variant without Greencam (monitor and camera). The basic model is one such variant, in which signalling in the cab takes place via an in-cab display, with the distance being visually represented by means of LEDs, and acoustic signals.

Proceed as follows to position and mount the in-cab display:

1. Select a position for the in-cab display on the driver's side of the cab.
2. Ensure that the in-cab display is positioned if at all possible within the driver's field of view, but without restricting his driving view.
3. Ensure that the in-cab display can be installed using the supplied installation materials without damaging the electrical wiring and other vehicle components.
4. Route the in-cab display lead alongside existing wiring behind the dashboard from the control unit to the in-cab display.
5. Make the electrical connections as shown in the wiring diagrams. And use the right tools for the job.

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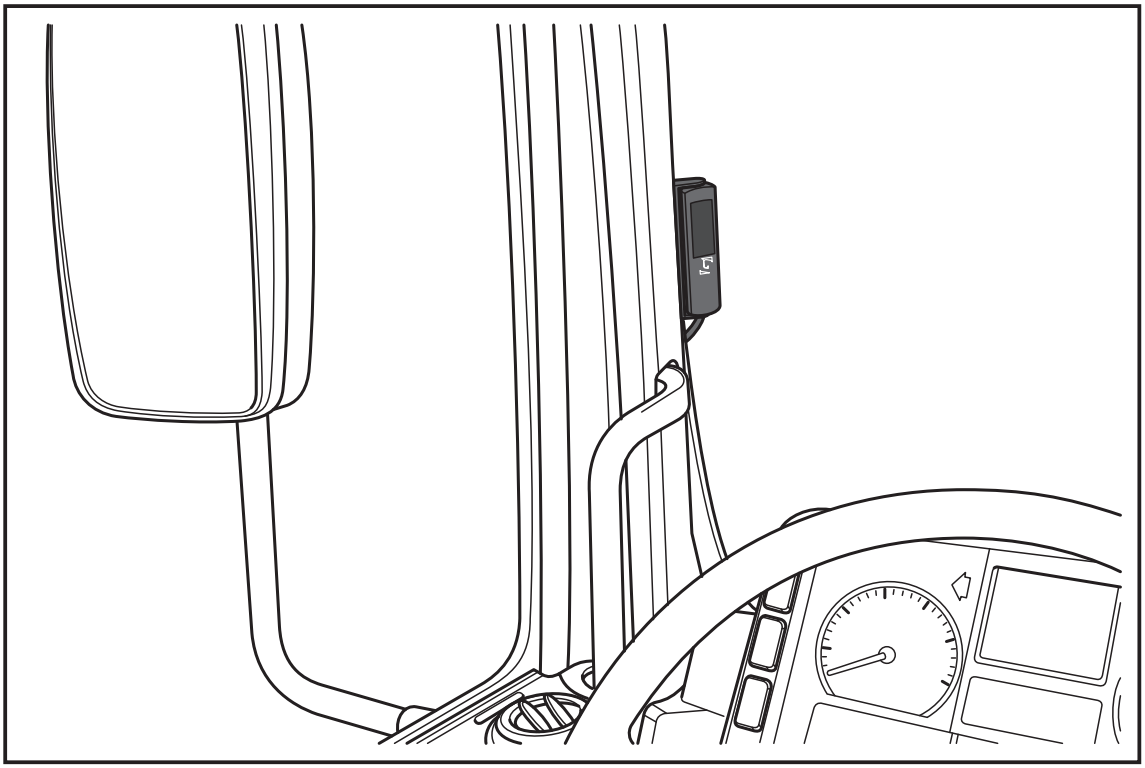

Figure 3.23 In-cab display on the A-pillar

3.8.1 In-cab display error codes

The in-cab display is controlled by the Greensight control unit via the vehicle's CAN-bus. In addition to the acoustic and visual warnings given when objects are detected, the in-cab display is also capable of displaying an error code.
In the event of a malfunction, after the self-test and separate from the indications of the LED's, the in-cab display will also display an error code corresponding to the malfunction.
The table below shows the meaning of the error codes that may appear on the in-cab display.

*Error code**	*Meaning*
FFF	Communication error detected.
F1 - F2 - F3	Left bottom sensor or sensor cable error detected.
F4 - F5 - F6	Right bottom sensor or sensor cable error detected.
F7	Left and right bottom sensor or sensor cable error detected.
E1	Left top/side sensor or sensor cable error detected.
E2	Right top/side sensor or sensor cable error detected.
HF	Hardware failure detected.
F10	Supply voltage error detected.
F11	Memory error detected.
F12	Temperature error detected.

* The error code is basically an indication. Other components than the ones indicated in this chart may be defective.

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3.9 Greencam monitor

Groeneveld has developed Greencam which offers unique features to support Greensight.

The Greencam monitor is a 7" LCD colour monitor with a colour identification bar for the 3 different detection zones of the Greensight reversing safety system. Besides the reversing camera this monitor can be extended with 3 additional cameras (side, front and extra) and a Siemens/VDO MC5200 navigation system.

The Greencam in-cab monitor meets all EU requirements inclusive 2005/27/EC regulation. So the Greencam in-cab monitor can be used in combination with a front view camera which meets R46.

The monitor kit includes standard a mounting bracket, that can be attached to the prepared monitor body in various positions.

The Greencam monitor is available in a dashboard mounted version. The monitor cannot be installed in a double DIN slot.

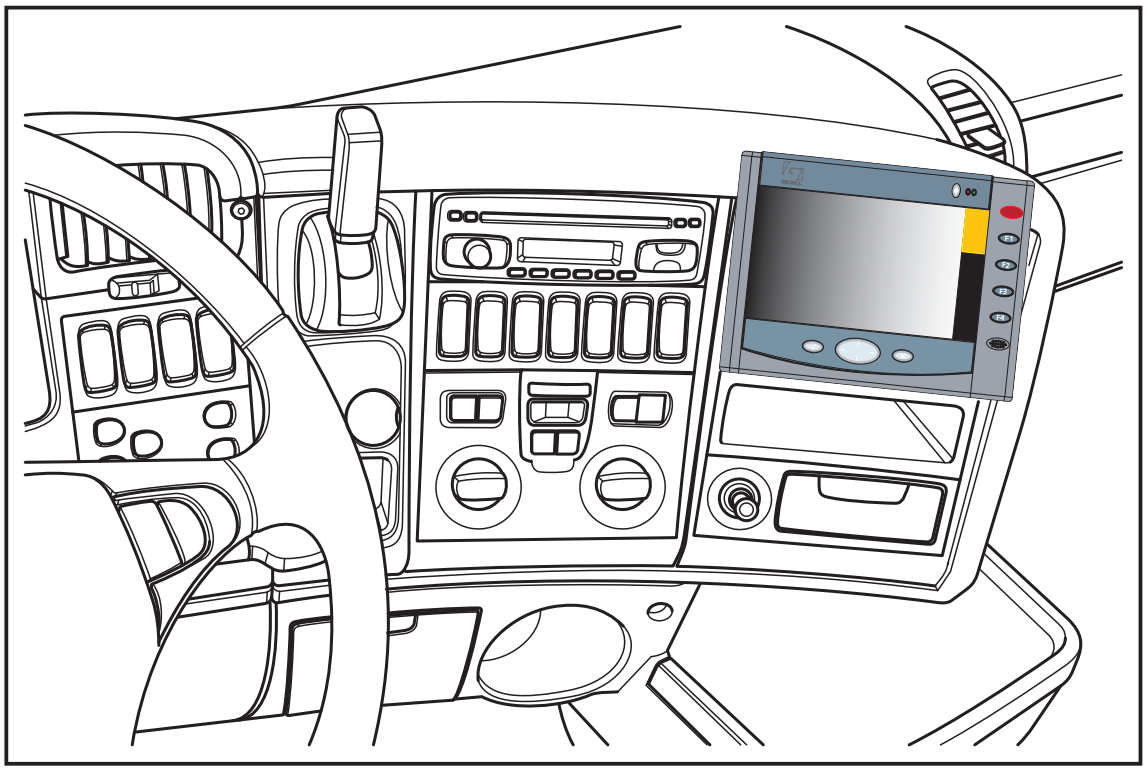

Figure 3.24 Greencam monitor with mounting bracket

Proceed as follows to mount the Greencam monitor:

1. When making use of the mounting bracket select a mounting position on the dashboard that provides the driver with a good view of the picture, but does not otherwise hinder the driver's view. Whenever possible, discuss the preferred mounting position with the customer. Avoid positioning the monitor above a heater outlet, or where it will be subject to vibration.

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ATTENTION
The mounting position of the Greencam monitor should:

- not obstruct the vehicle safety systems (e.g. airbags);
- not obstruct the driver's direct viewing point (from left to front to right hand side, incl. mirrors);
- be within a 1,35 meter radius from the position of the driver's head.

2. When making use of the mounting bracket, ensure that it is firmly fastened using the supplied installation materials.

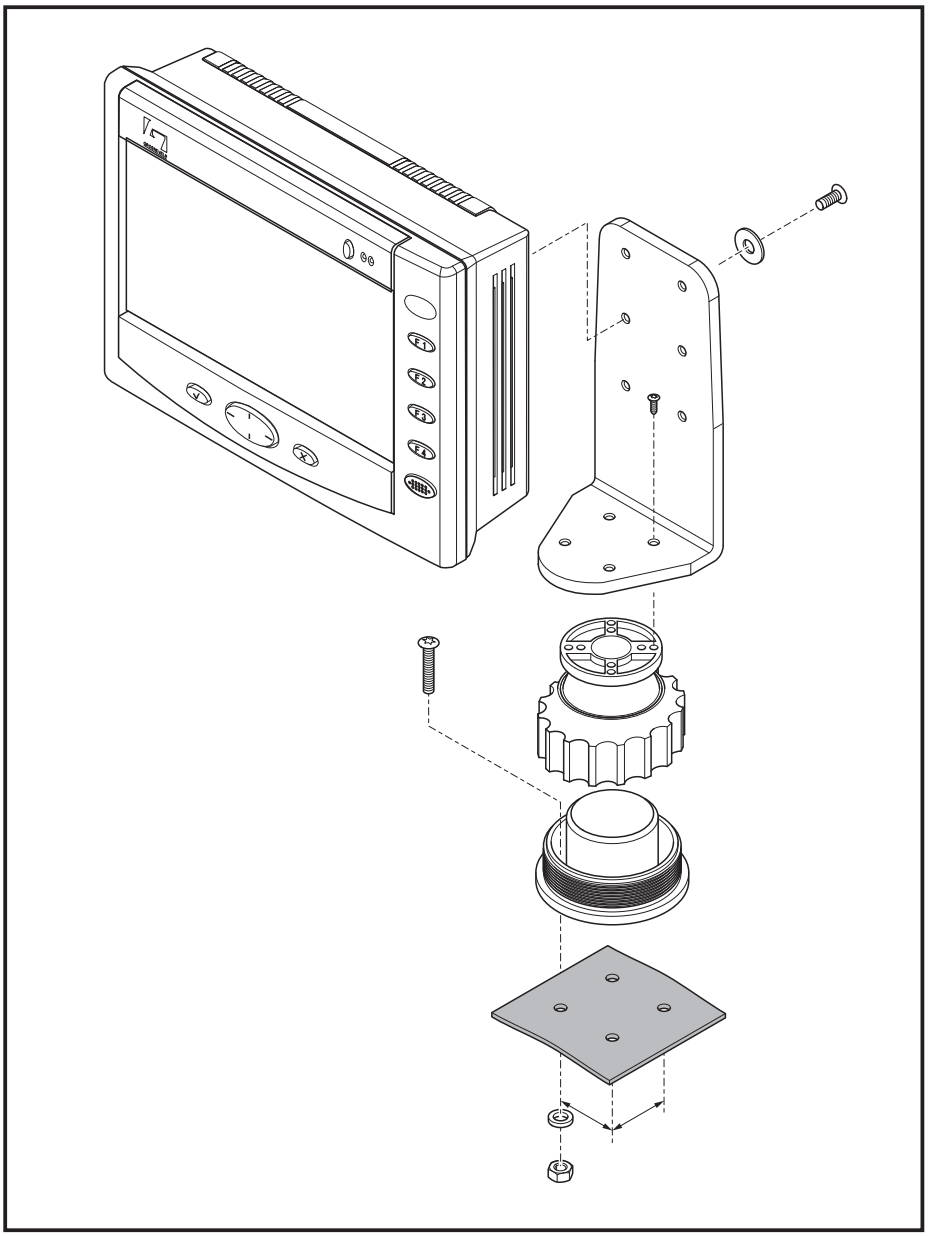

Figure 3.25 Installing a Greencam monitor using a mounting bracket

3. Route the monitor lead alongside existing wiring behind the dashboard to the monitor and make the connections as shown in paragraph 2.1 System configurations and chapter 4. Wiring diagrams.

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3.10 Stickers

To alert the driver to the presence of a Greensight (active camera) detection system on the vehicle, the supplied parts include a sticker.

ATTENTION
It is mandatory to affix these stickers at one of the (recommended) points on the vehicle shown below.

3.10.1 In-cab display or monitor variant

In the case of a vehicle with in-cab display or monitor, the kits will contain a transparent sticker (see Figure 3.27 and Figure 3.28).
We recommend affixing this sticker low down on the windscreen on the driver's side, close to the A-pillar, but without restricting the driver's view (Figure 3.26).
Do not forget to fill-in the boundary areas of the zones on the sticker.

Figure 3.26 Location in-cab display or monitor sticker

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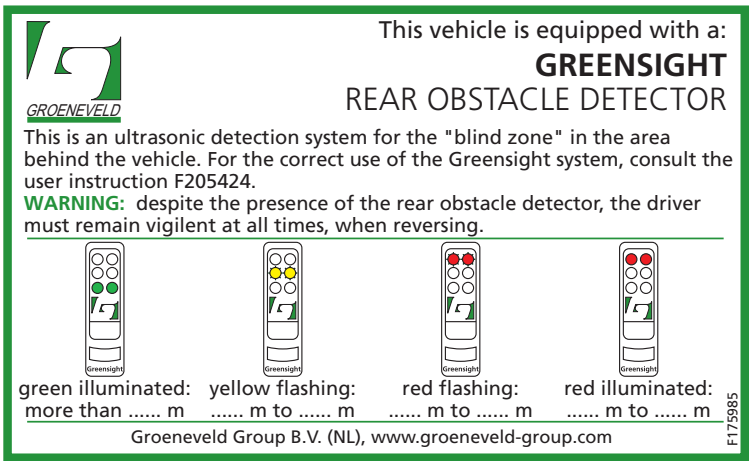
This vehicle is equipped with a:
GREENSIGHT
REAR OBSTACLE DETECTOR
GROENEVELD
This is an ultrasonic detection system for the "blind zone" in the area behind the vehicle. For the correct use of the Greensight system, consult the user instruction F205424.
WARNING: despite the presence of the rear obstacle detector, the driver must remain vigilent at all times, when reversing.
green illuminated: more than ..... m
yellow flashing: ..... m to ..... m
red flashing: ..... m to ..... m
red illuminated: ..... m to ..... m
Groeneveld Group B.V. (NL), www.groeneveld-group.com
F175985

Figure 3.27 In-cab display sticker

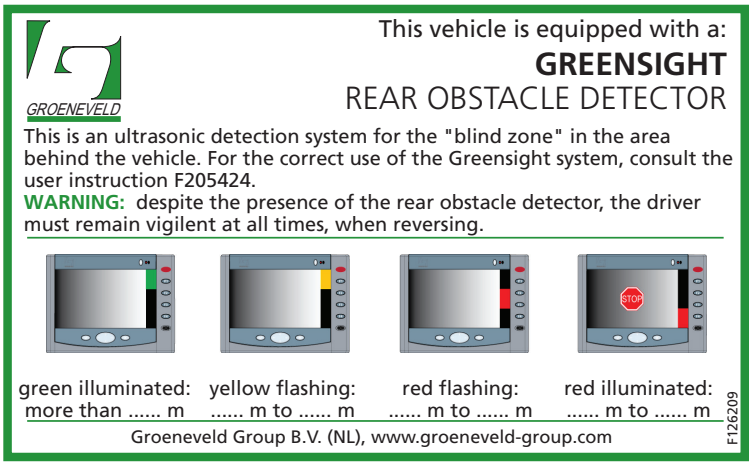
This vehicle is equipped with a:
GREENSIGHT
REAR OBSTACLE DETECTOR
GROENEVELD
This is an ultrasonic detection system for the "blind zone" in the area behind the vehicle. For the correct use of the Greensight system, consult the user instruction F205424.
WARNING: despite the presence of the rear obstacle detector, the driver must remain vigilent at all times, when reversing.
STOP
green illuminated: more than ..... m
yellow flashing: ..... m to ..... m
red flashing: ..... m to ..... m
red illuminated: ..... m to ..... m
Groeneveld Group B.V. (NL), www.groeneveld-group.com
F126209

Figure 3.28 Monitor sticker

3.10.2 External lights variant

In case of a vehicle with external lights, the kit contains a white sticker which must be affixed to the headboard, close to the air connections, so that the data on the sticker (explanation of the signalling) immediately attracts the driver's attention.
Do not forget to fill-in the boundary areas of the zones on the sticker.

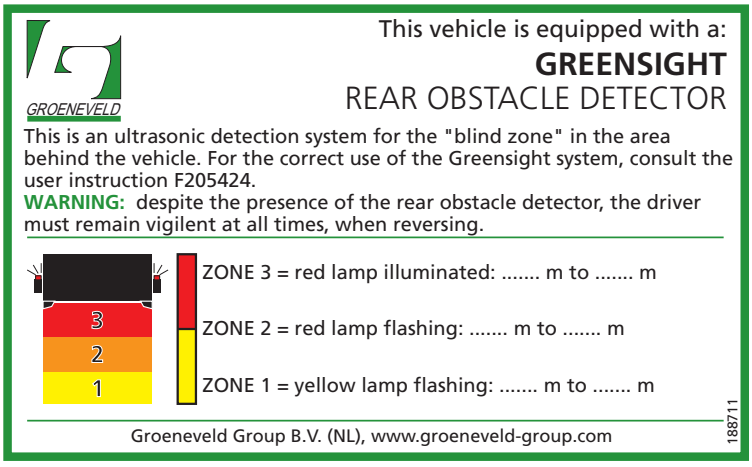
This vehicle is equipped with a:
GREENSIGHT
REAR OBSTACLE DETECTOR
GROENEVELD
This is an ultrasonic detection system for the "blind zone" in the area behind the vehicle. For the correct use of the Greensight system, consult the user instruction F205424.
WARNING: despite the presence of the rear obstacle detector, the driver must remain vigilent at all times, when reversing.
3
2
1
ZONE 3 = red lamp illuminated: ..... m to ..... m
ZONE 2 = red lamp flashing: ..... m to ..... m
ZONE 1 = yellow lamp flashing: ..... m to ..... m
Groeneveld Group B.V. (NL), www.groeneveld-group.com
188711

Figure 3.29 External lights sticker

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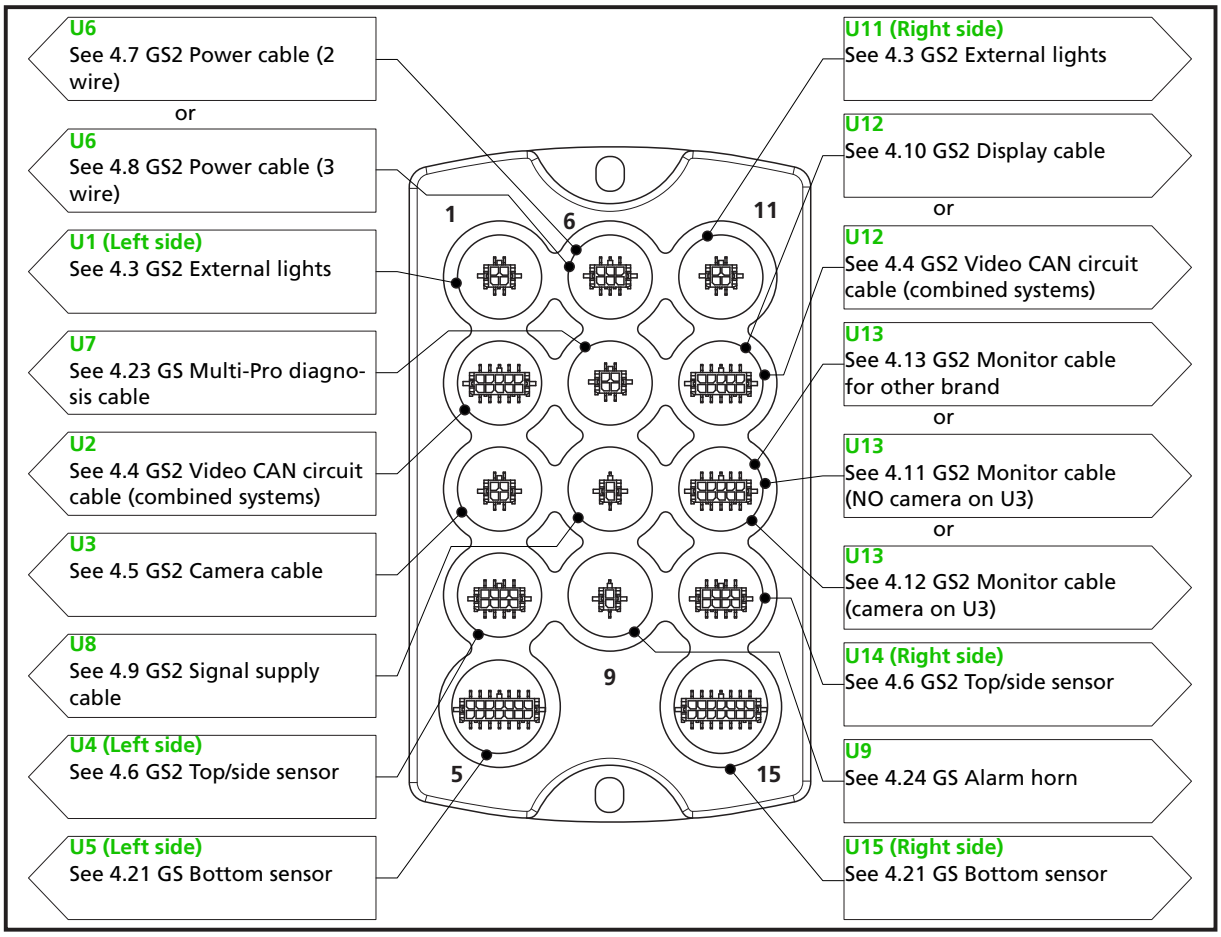
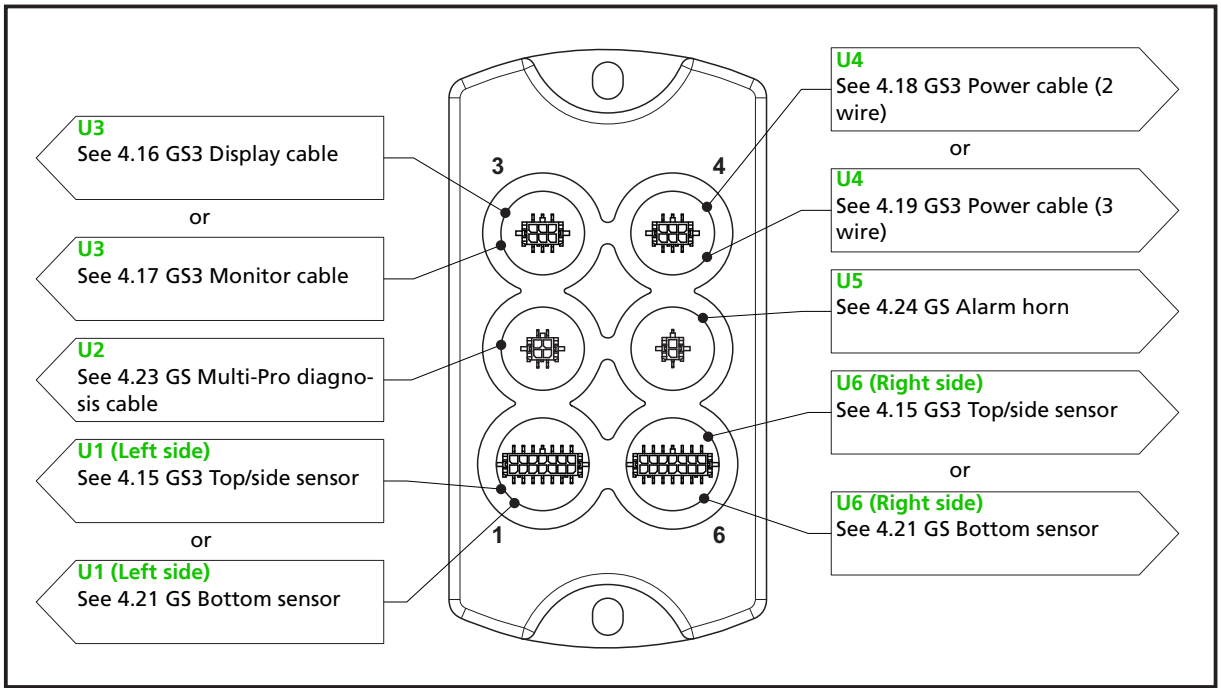
4. Wiring diagrams

4.1 GS2 Control unit



4.2 GS3 Control unit



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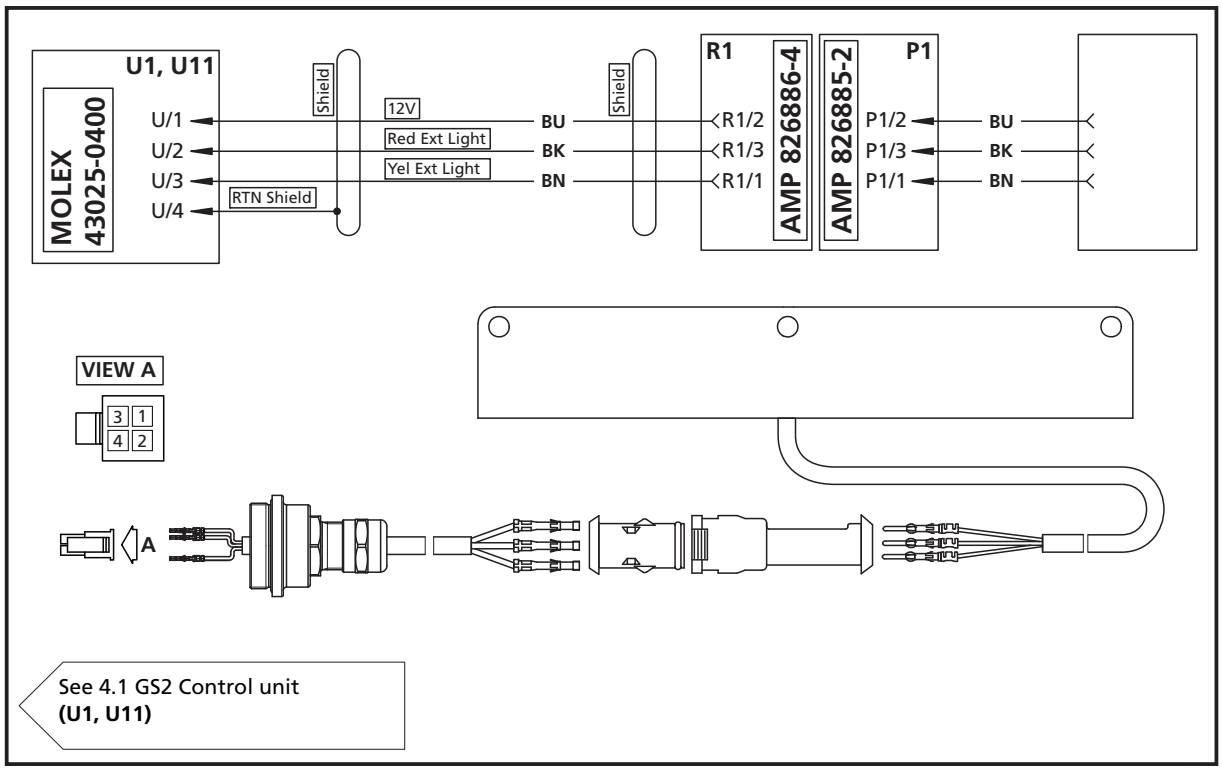
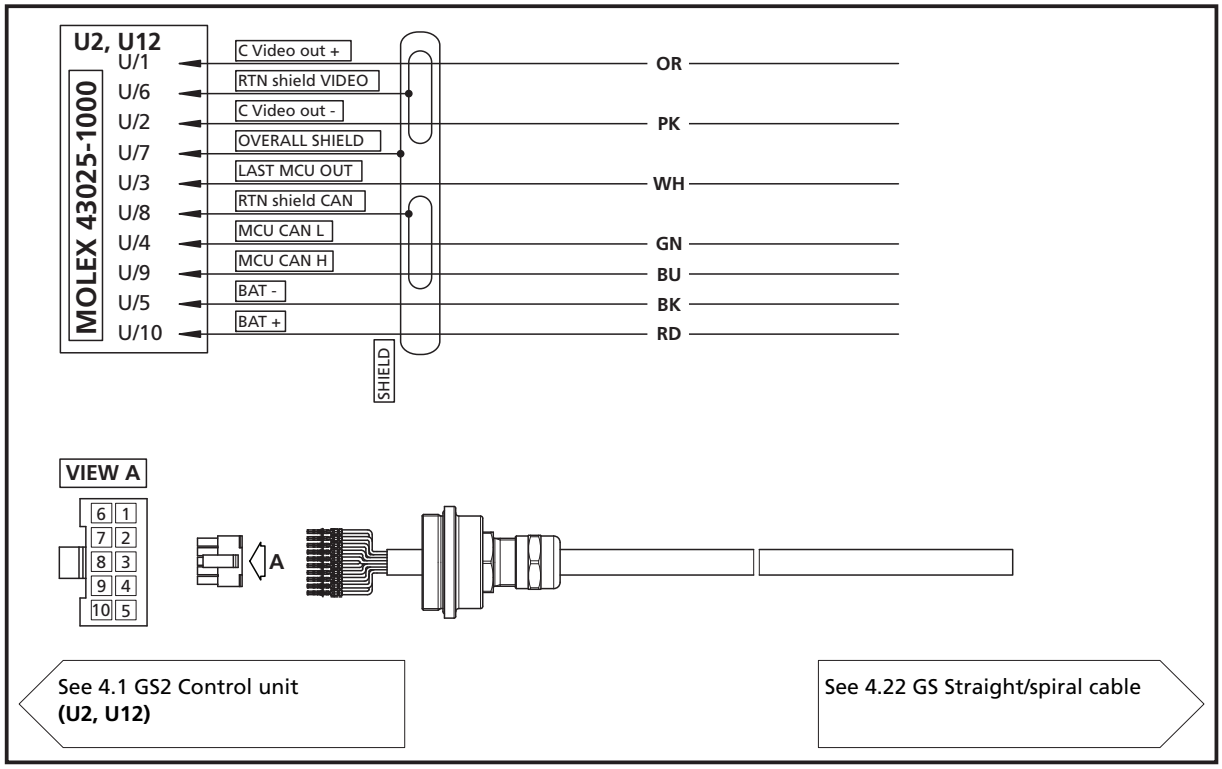
4.3 GS2 External lights



4.4 GS2 Video CAN circuit cable (combined systems)



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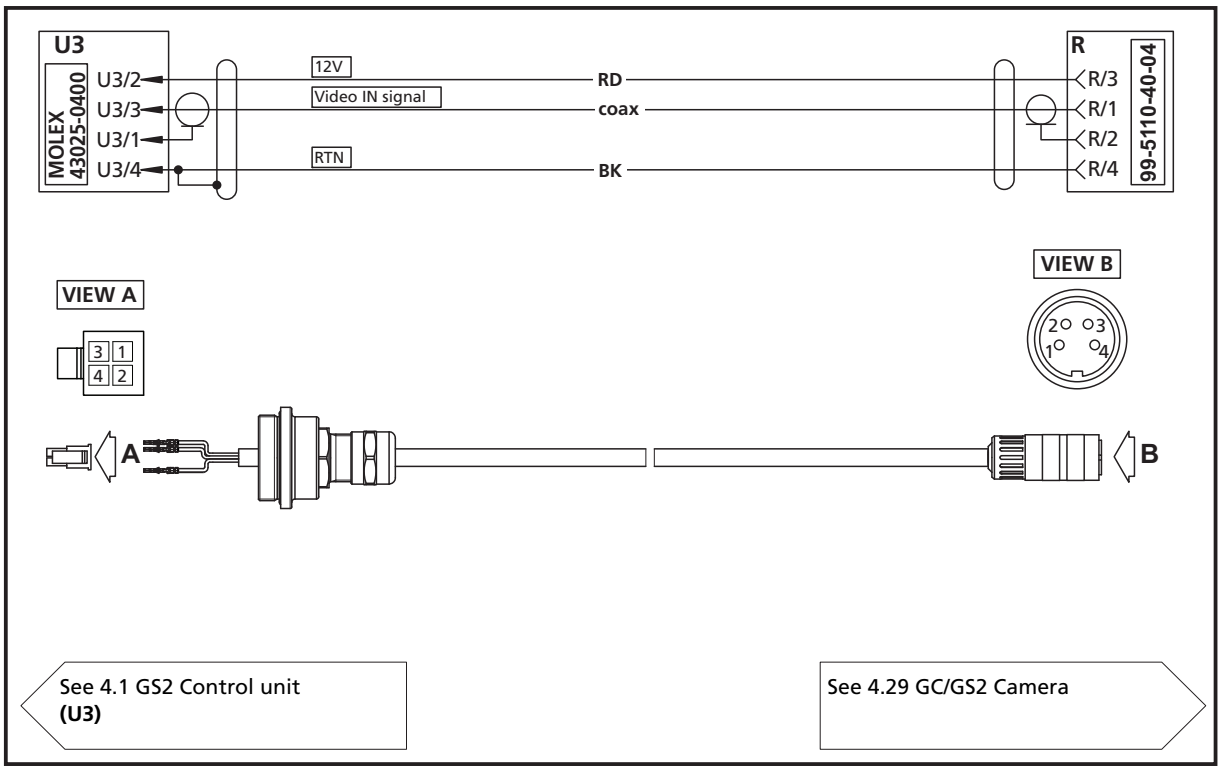
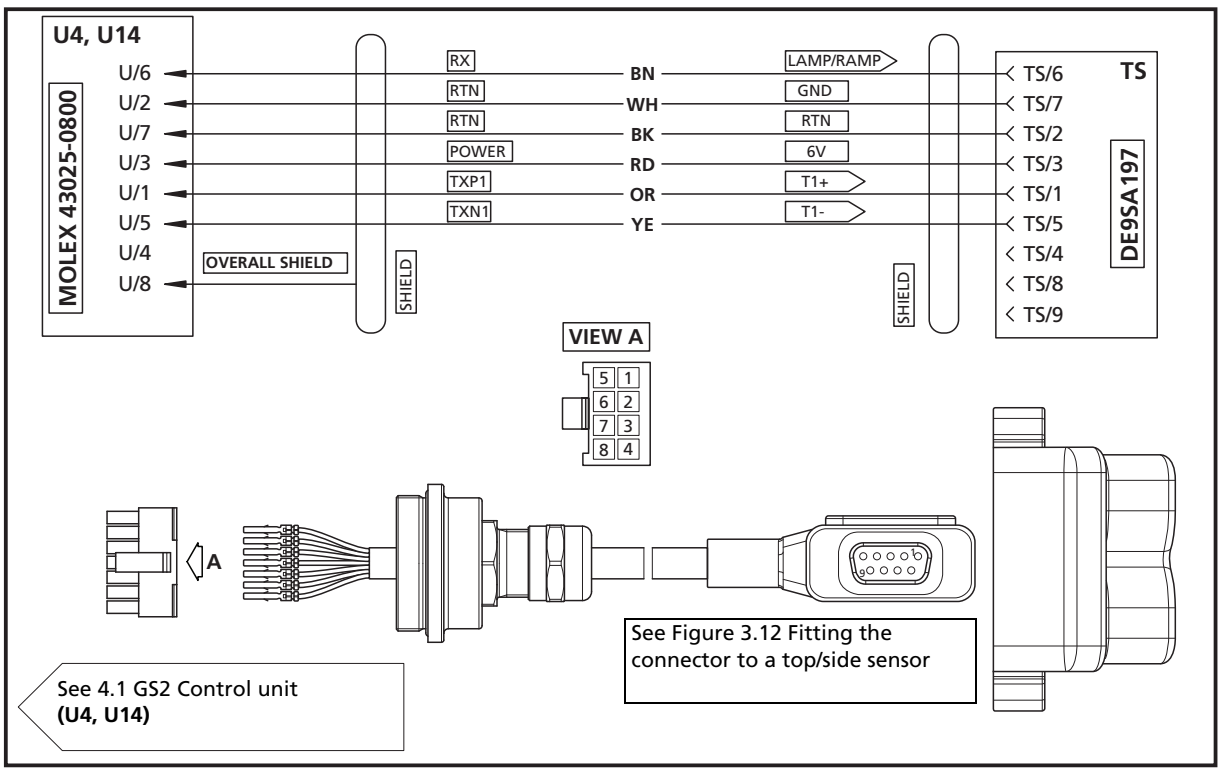
4.5 GS2 Camera cable



4.6 GS2 Top/side sensor



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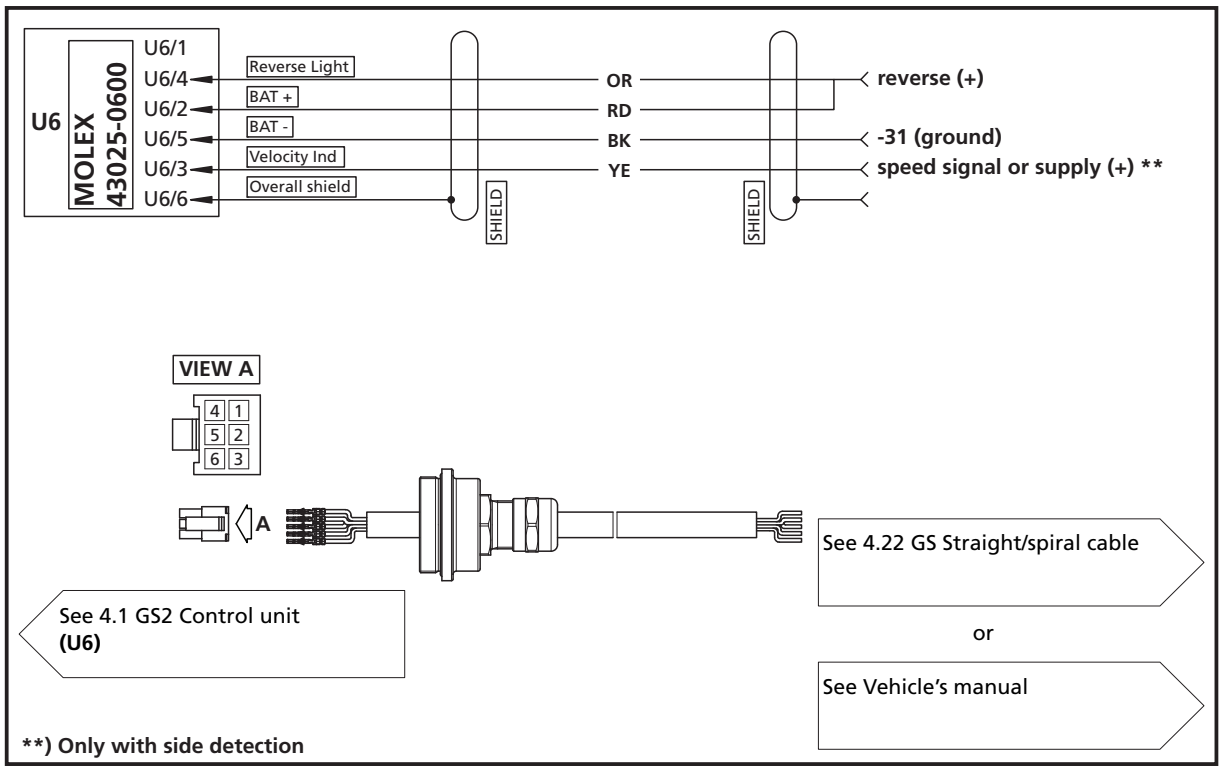
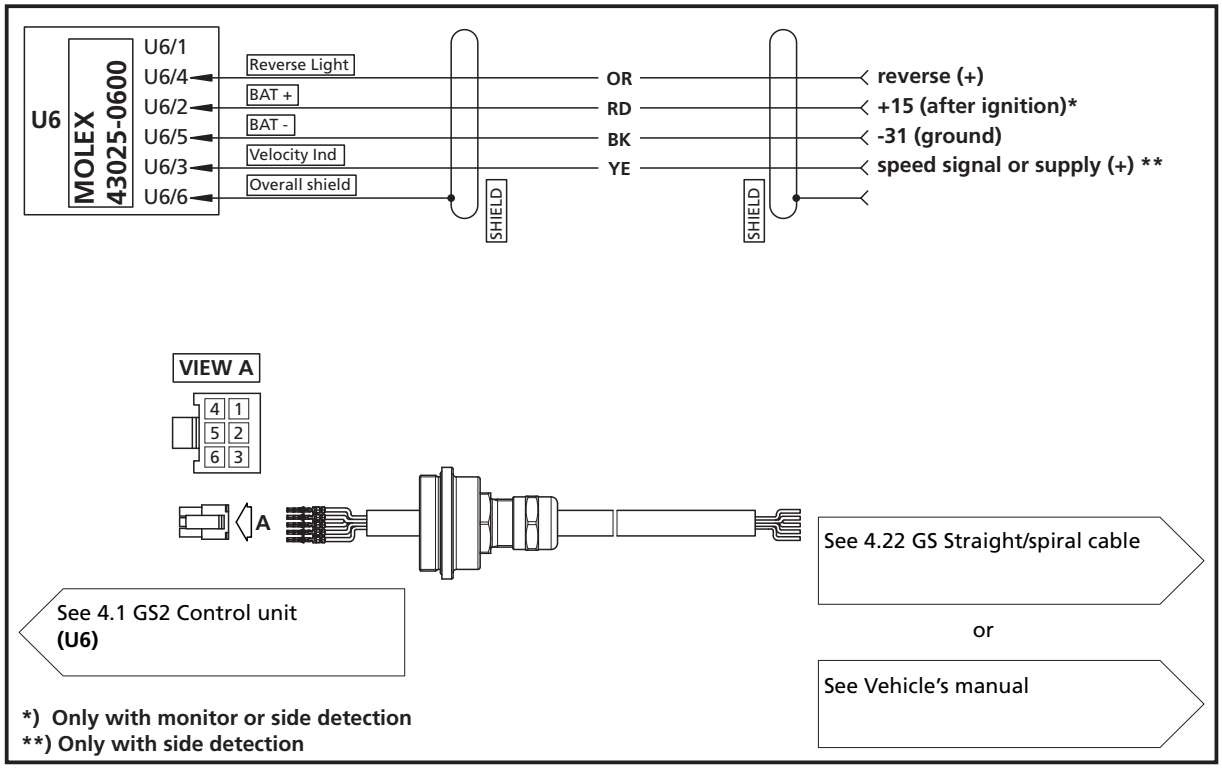
4.7 GS2 Power cable (2 wire)



4.8 GS2 Power cable (3 wire)



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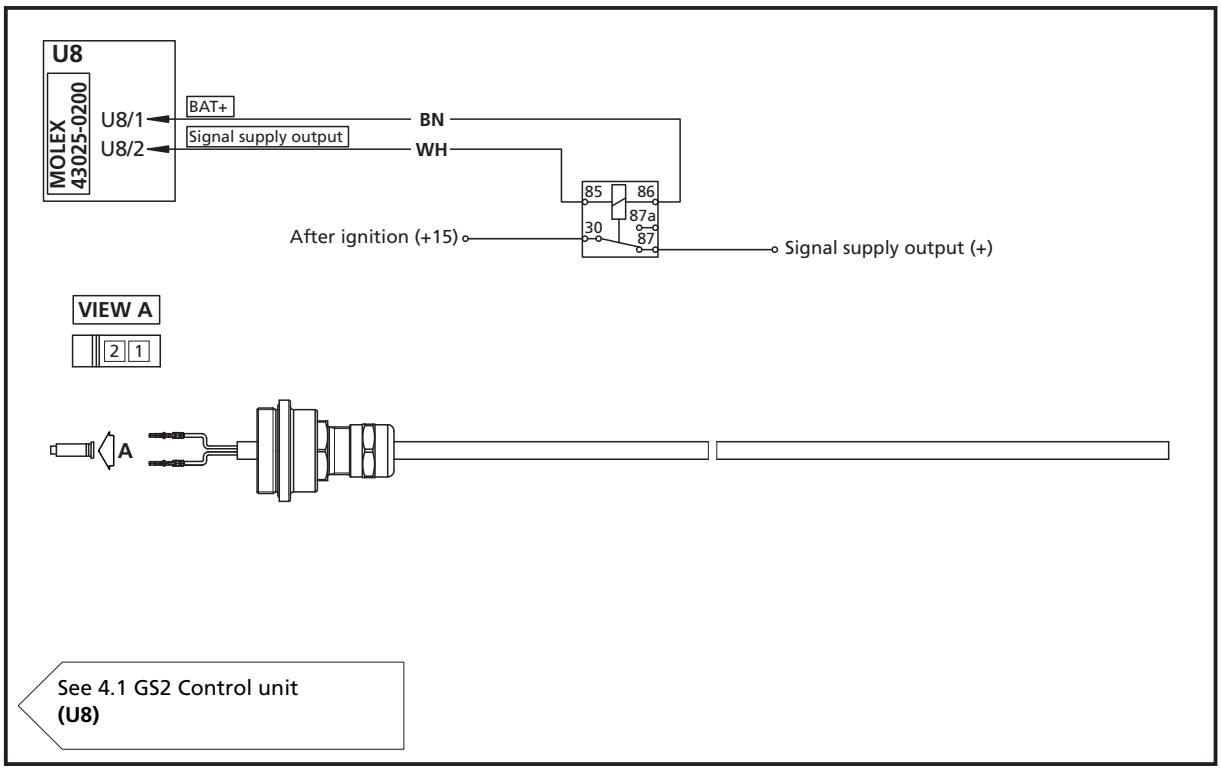
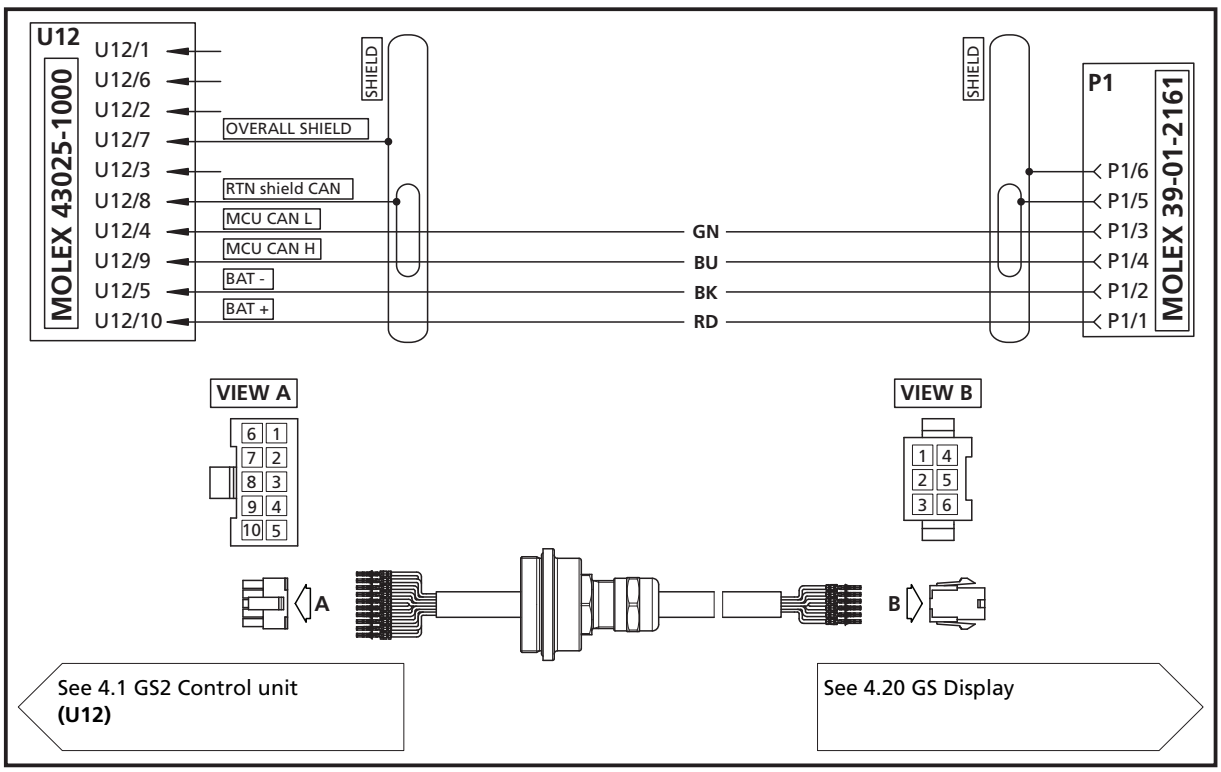
4.9 GS2 Signal supply cable



4.10 GS2 Display cable



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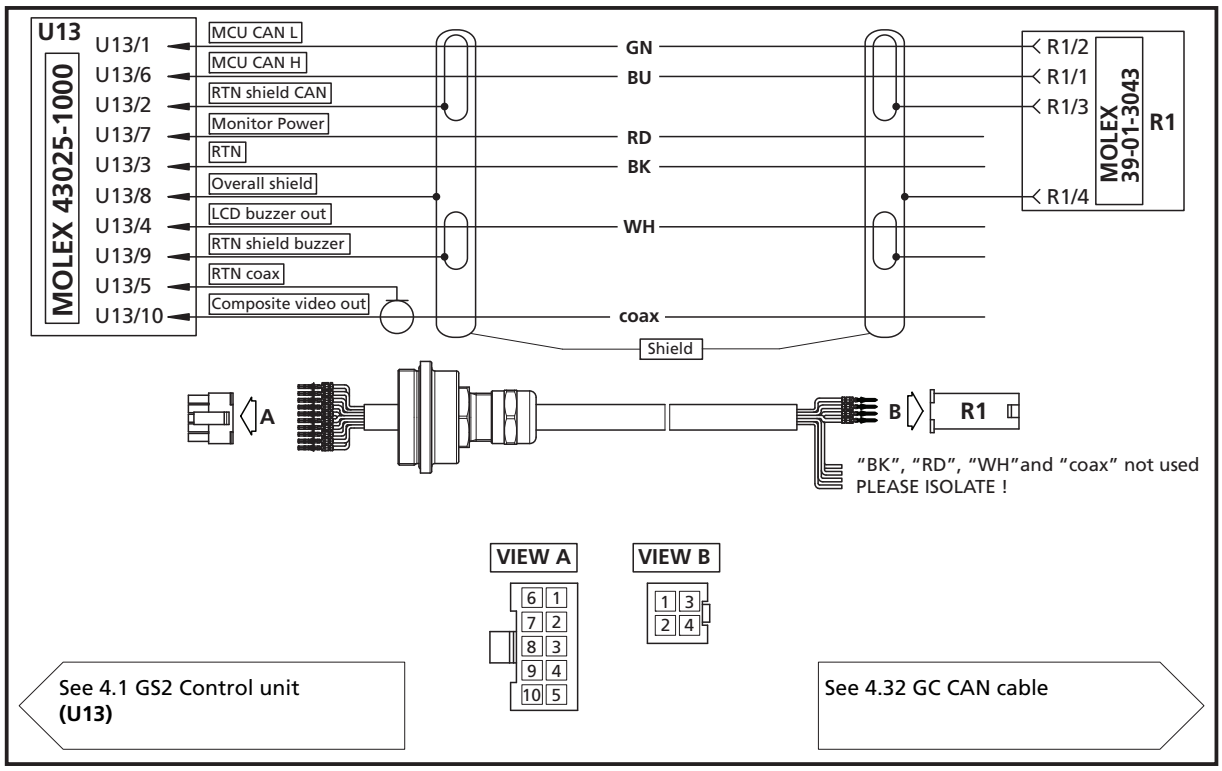
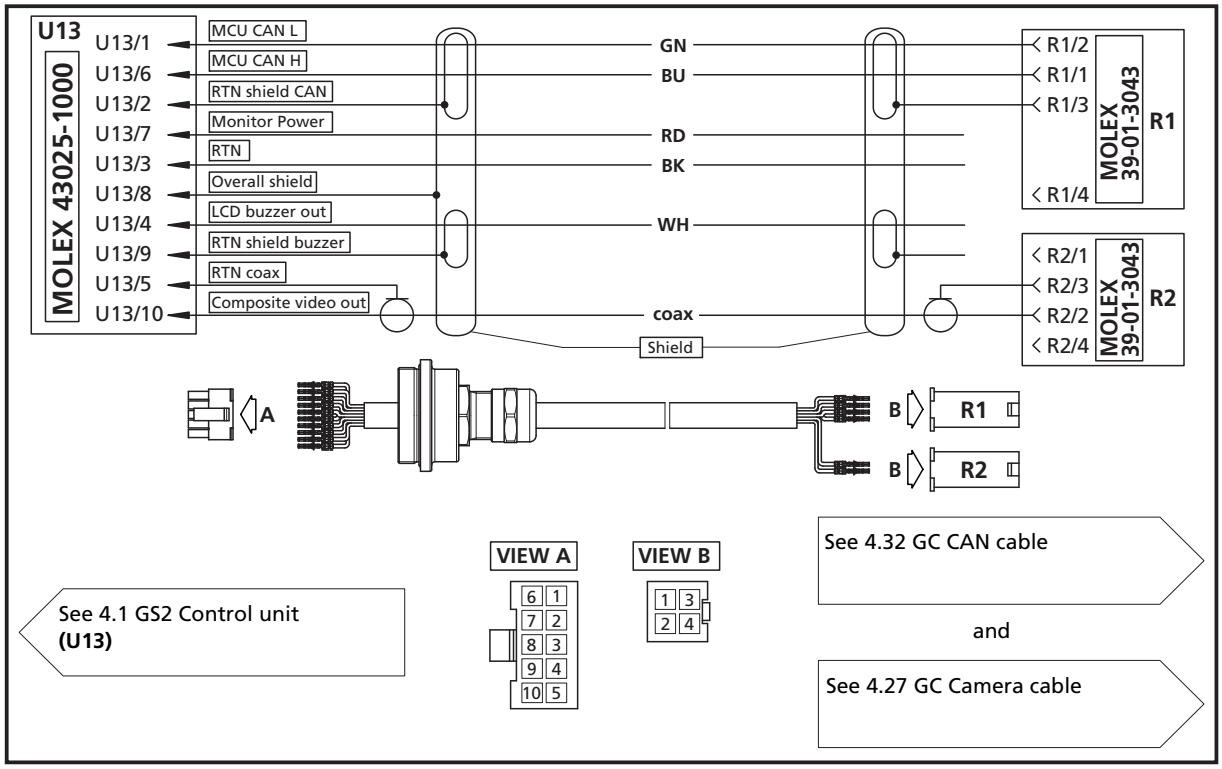
4.11 GS2 Monitor cable (NO camera on U3)



4.12 GS2 Monitor cable (camera on U3)



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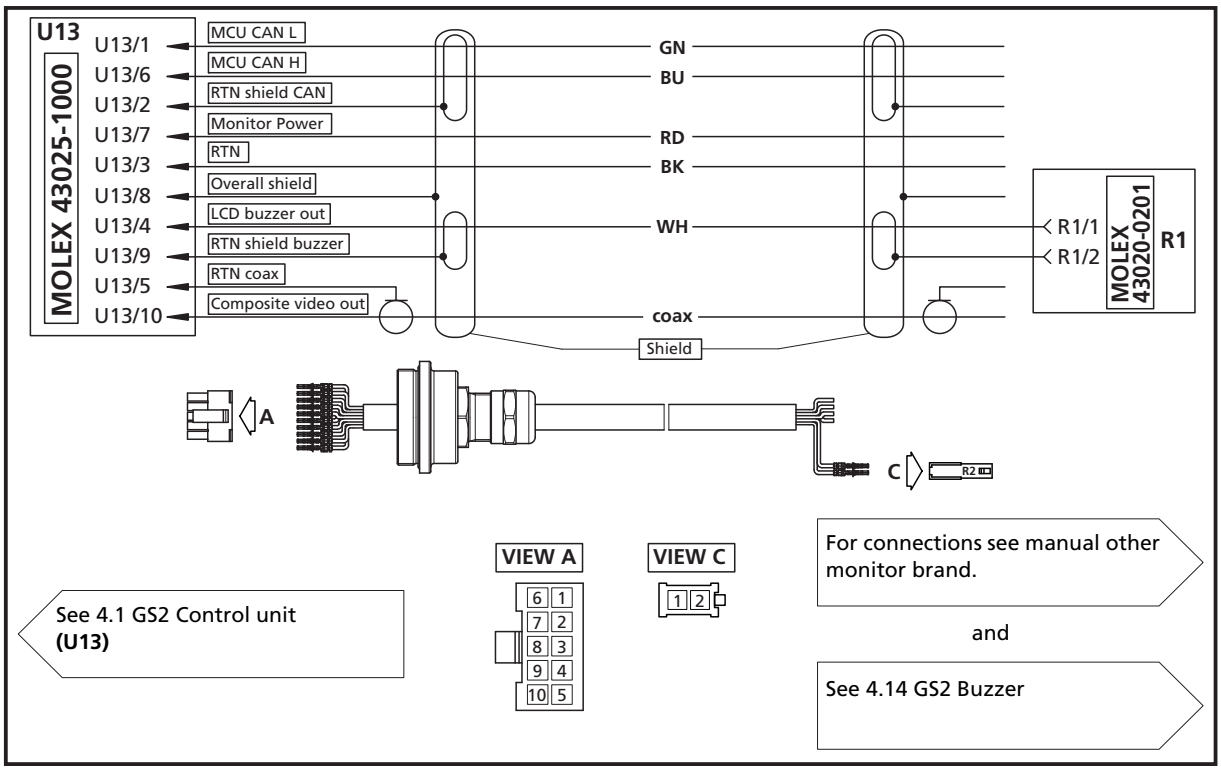
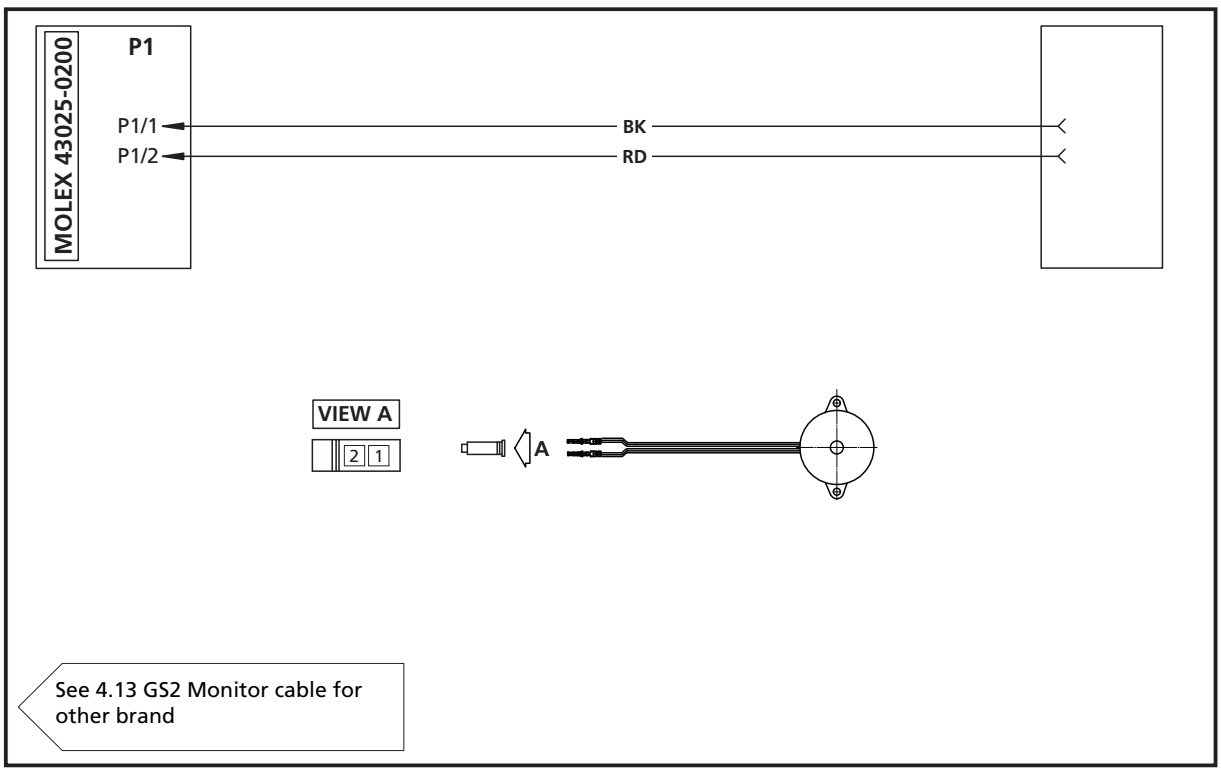
4.13 GS2 Monitor cable for other brand



4.14 GS2 Buzzer



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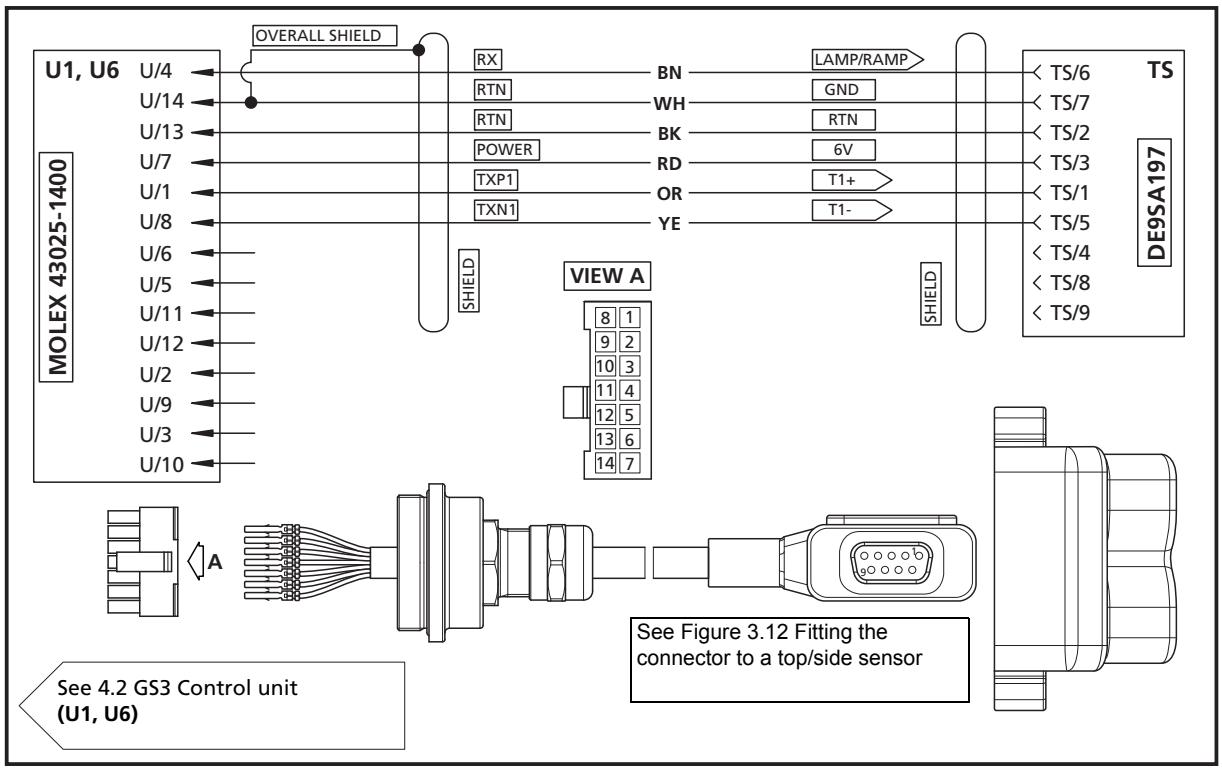
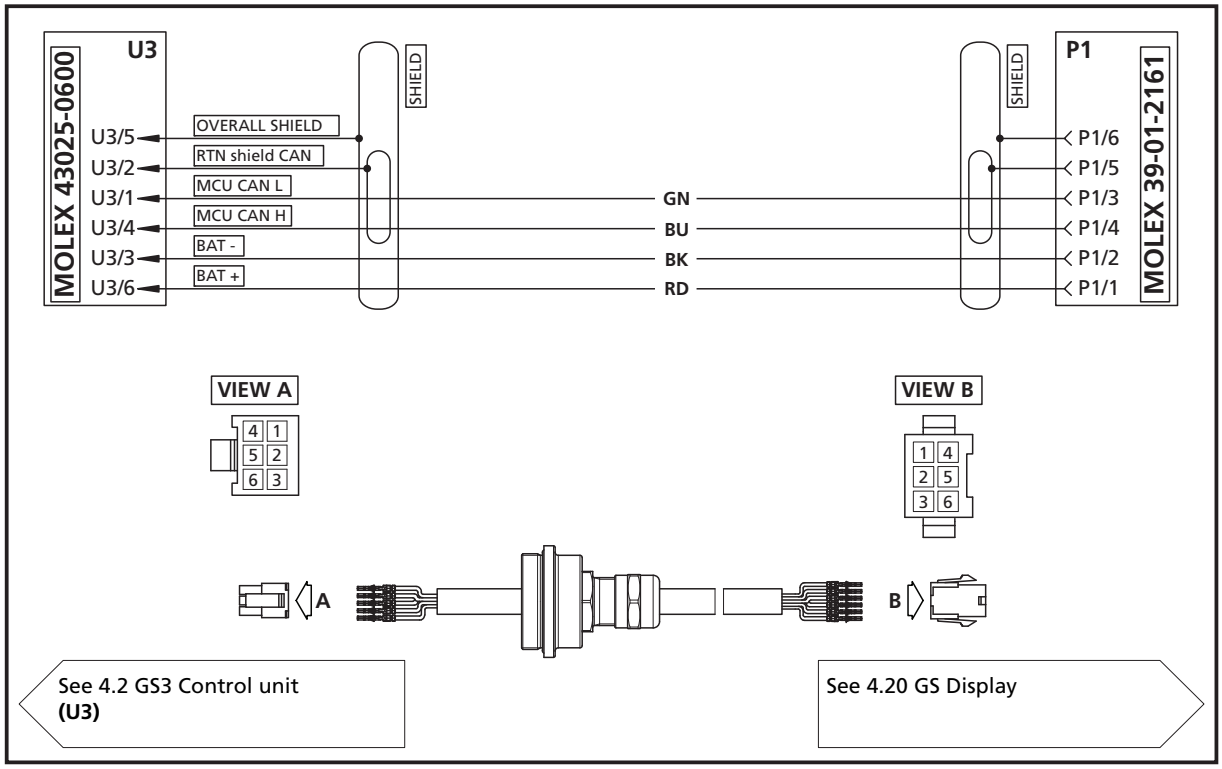
4.15 GS3 Top/side sensor



4.16 GS3 Display cable



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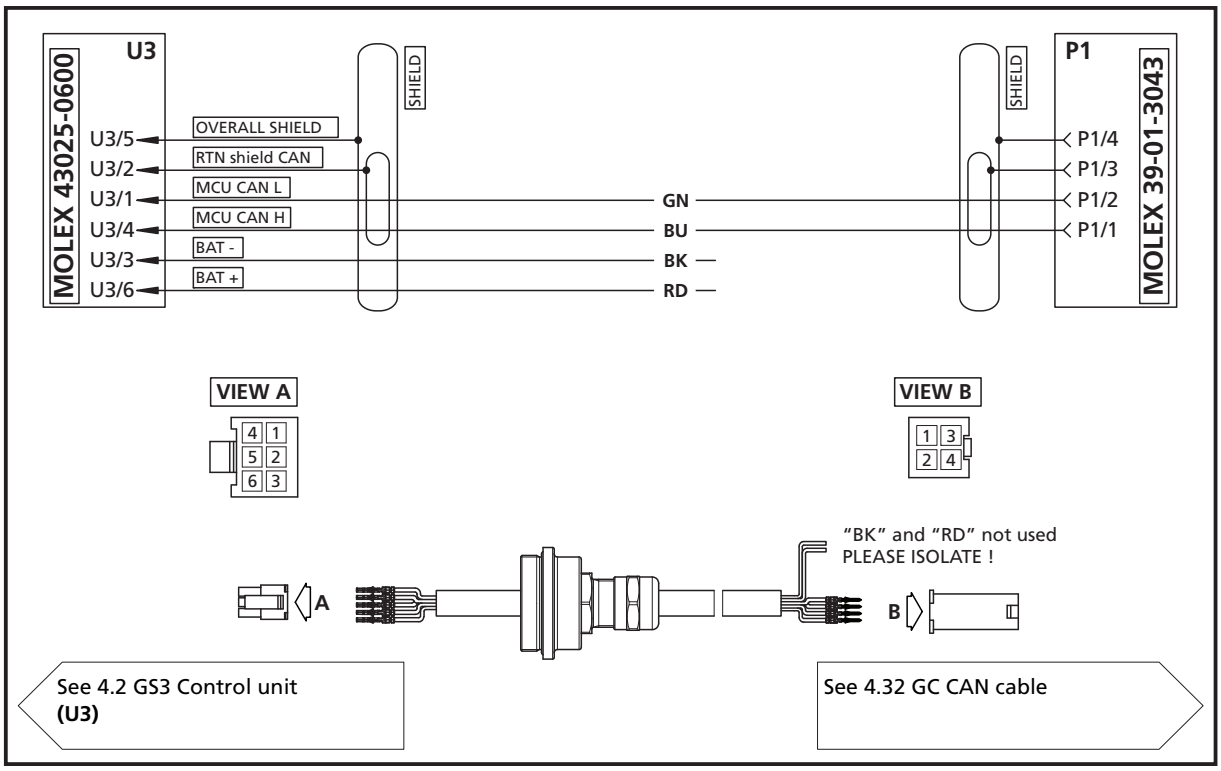
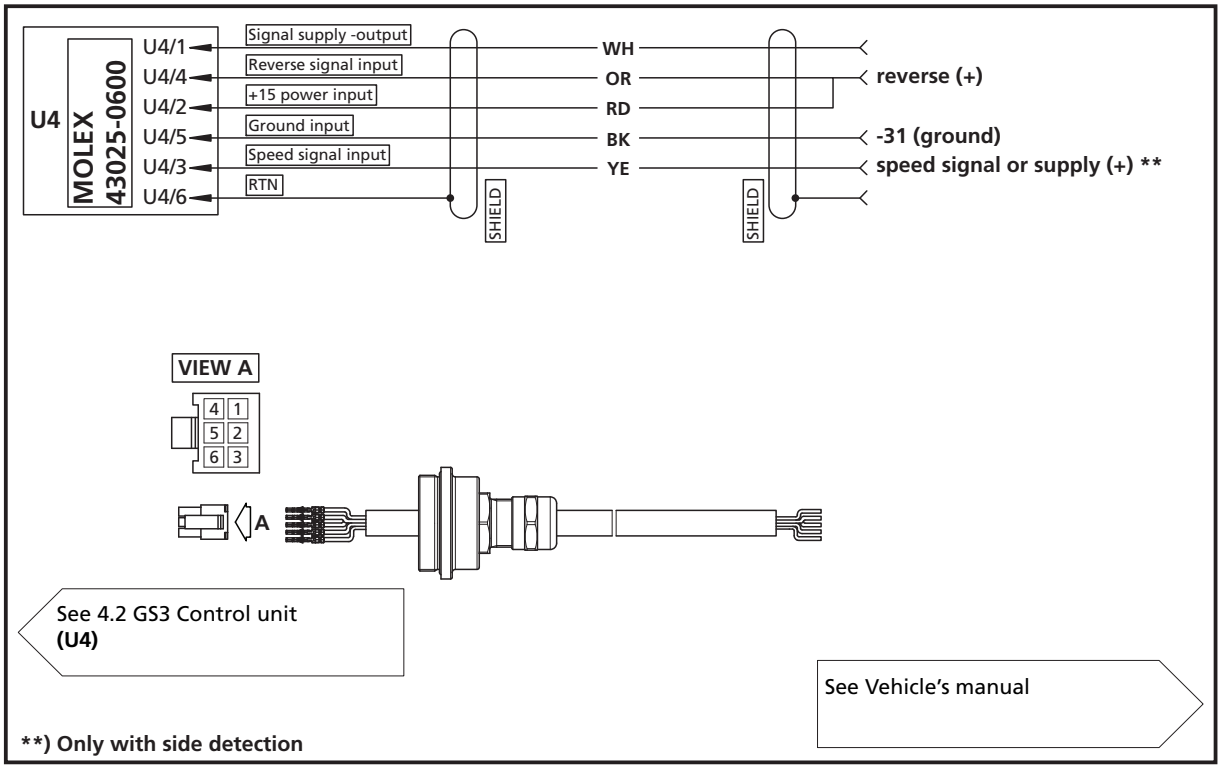
4.17 GS3 Monitor cable



4.18 GS3 Power cable (2 wire)



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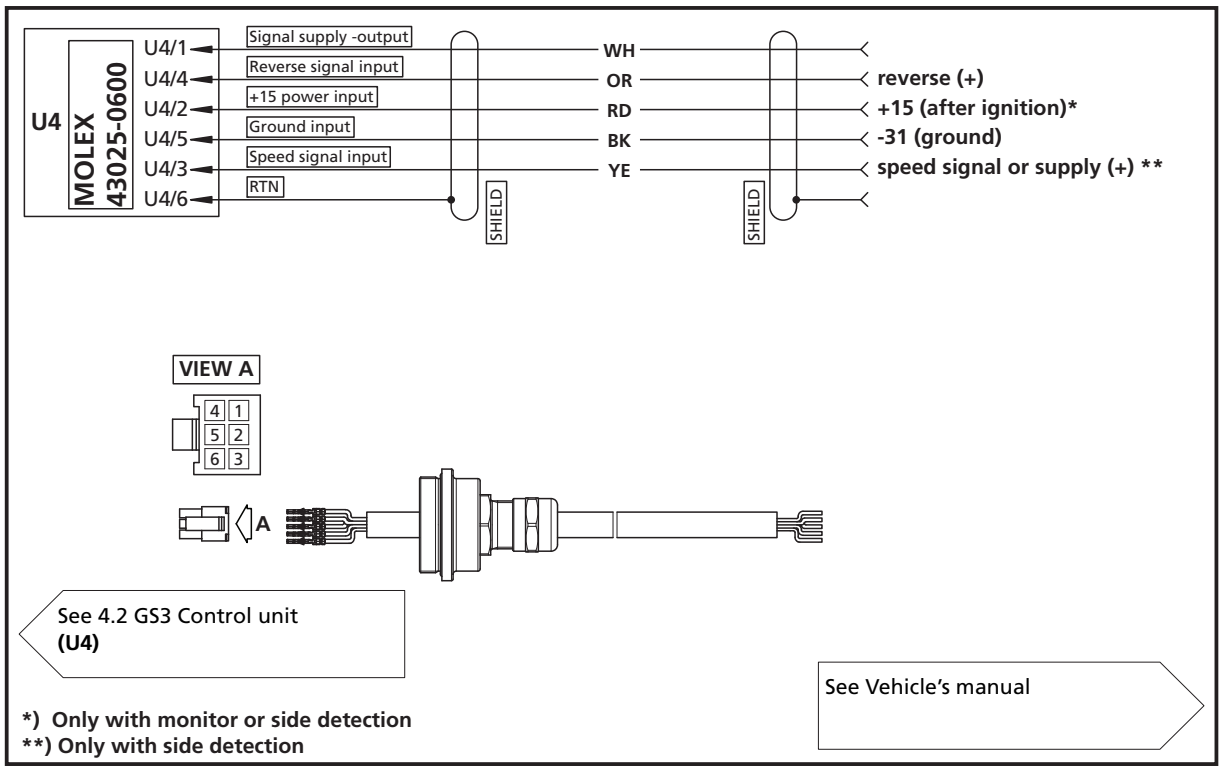
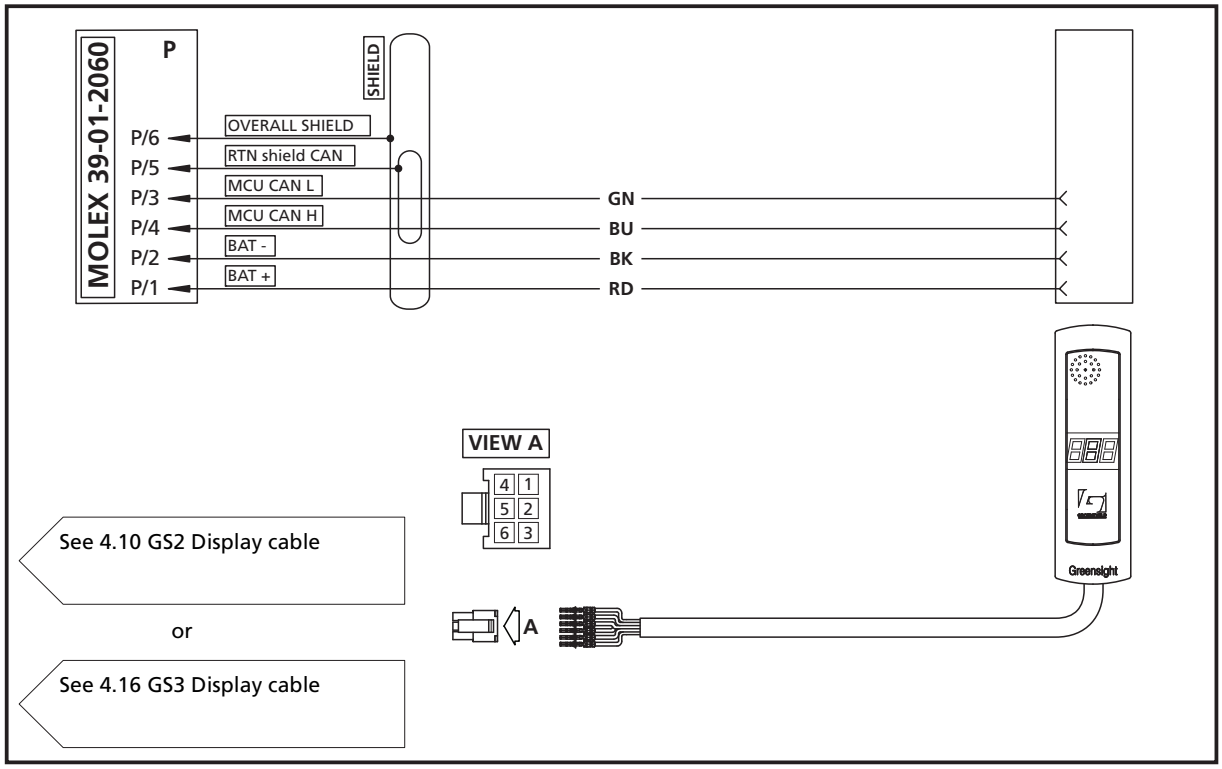
4.19 GS3 Power cable (3 wire)



4.20 GS Display



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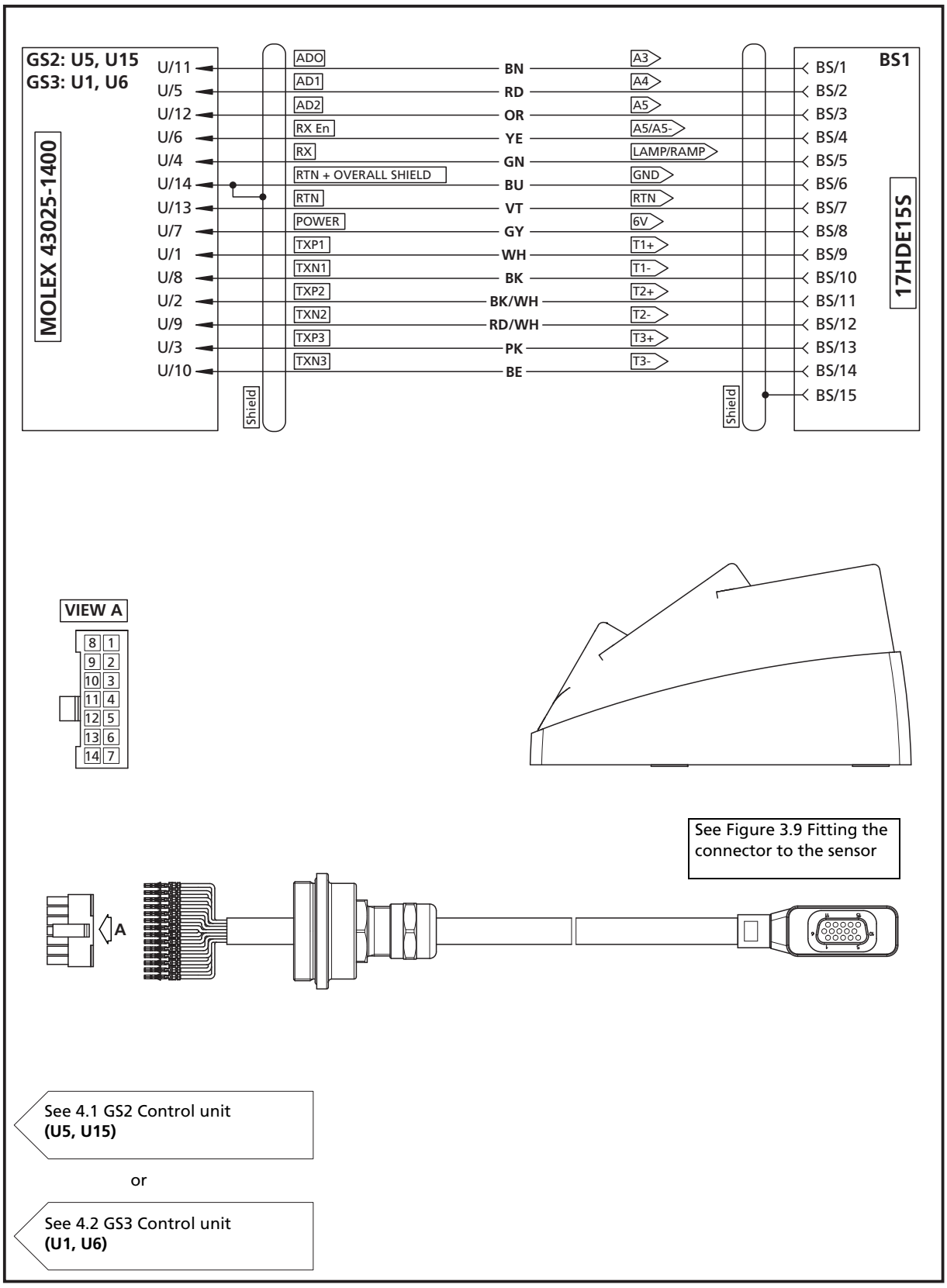
4.21 GS Bottom sensor



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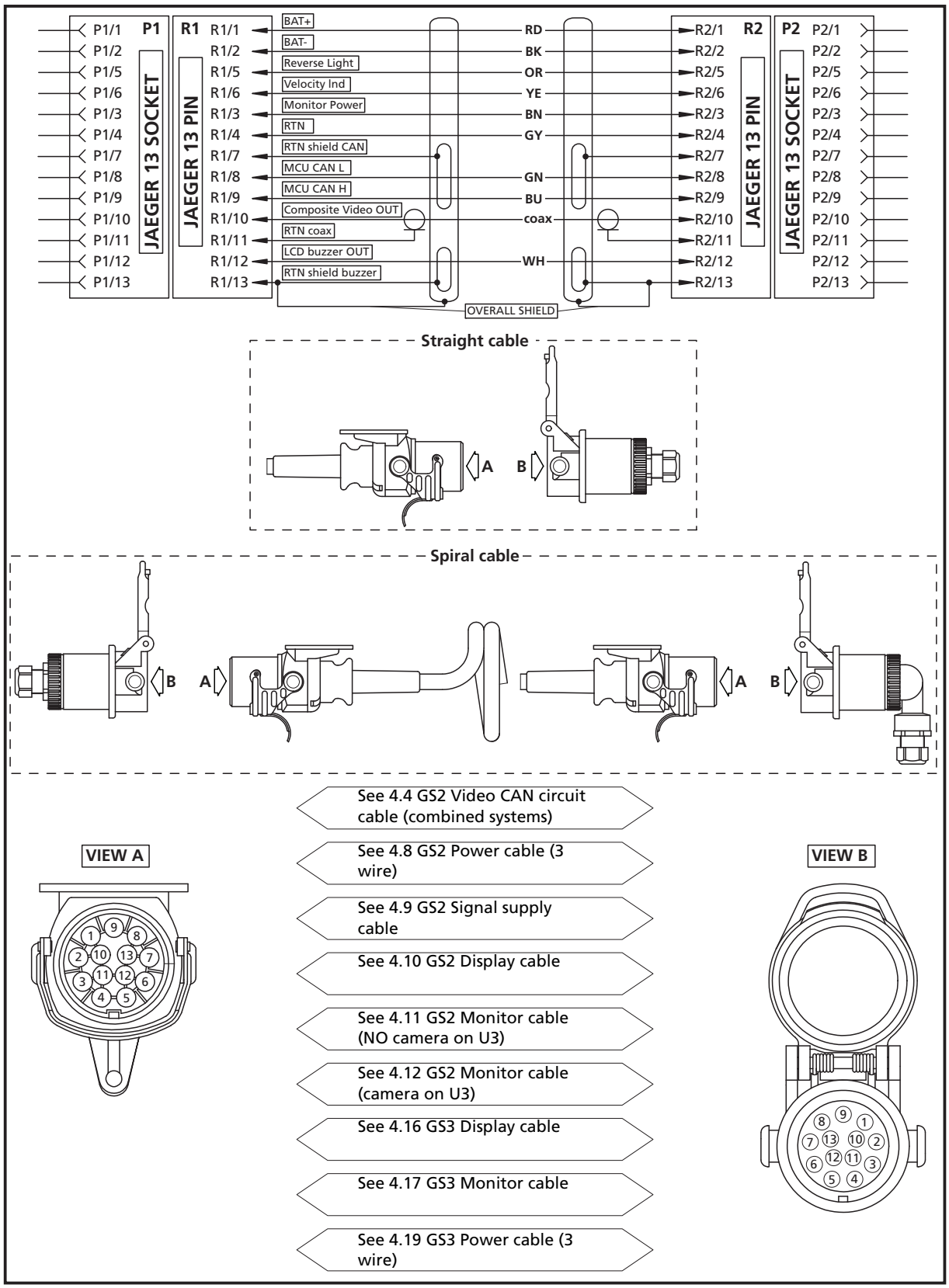
4.22 GS Straight/spiral cable



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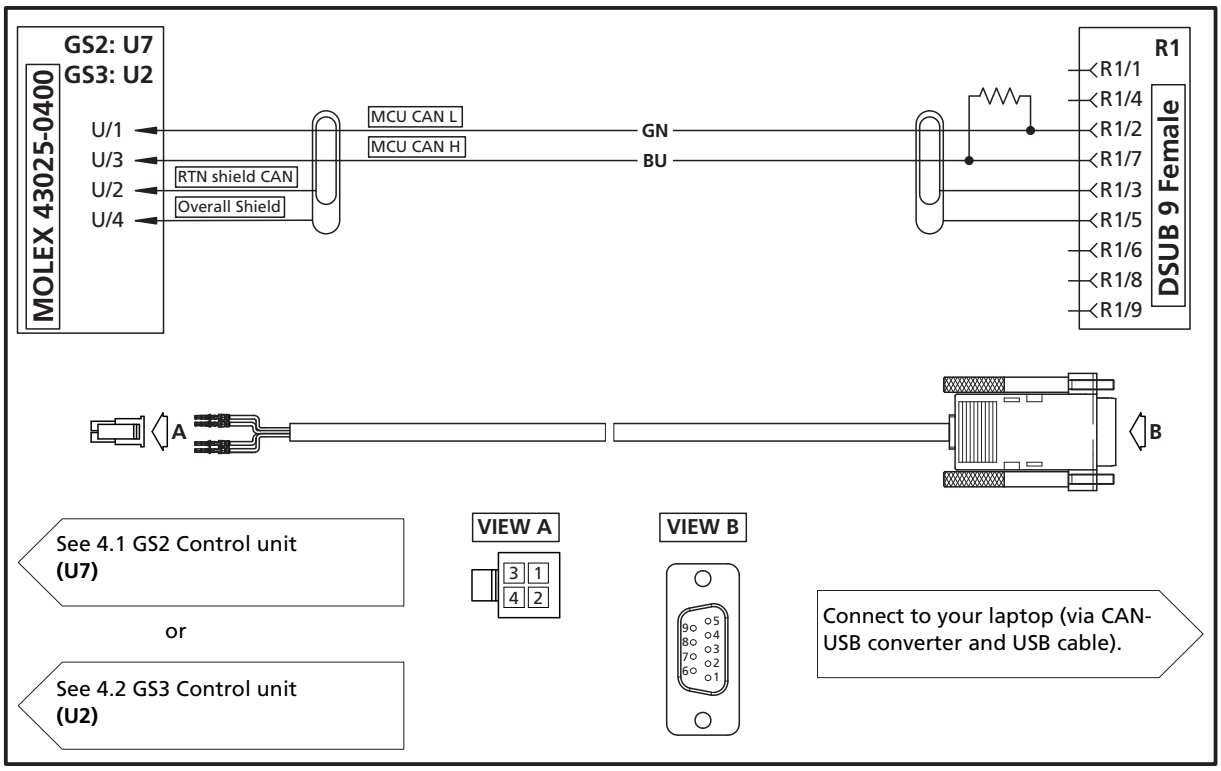
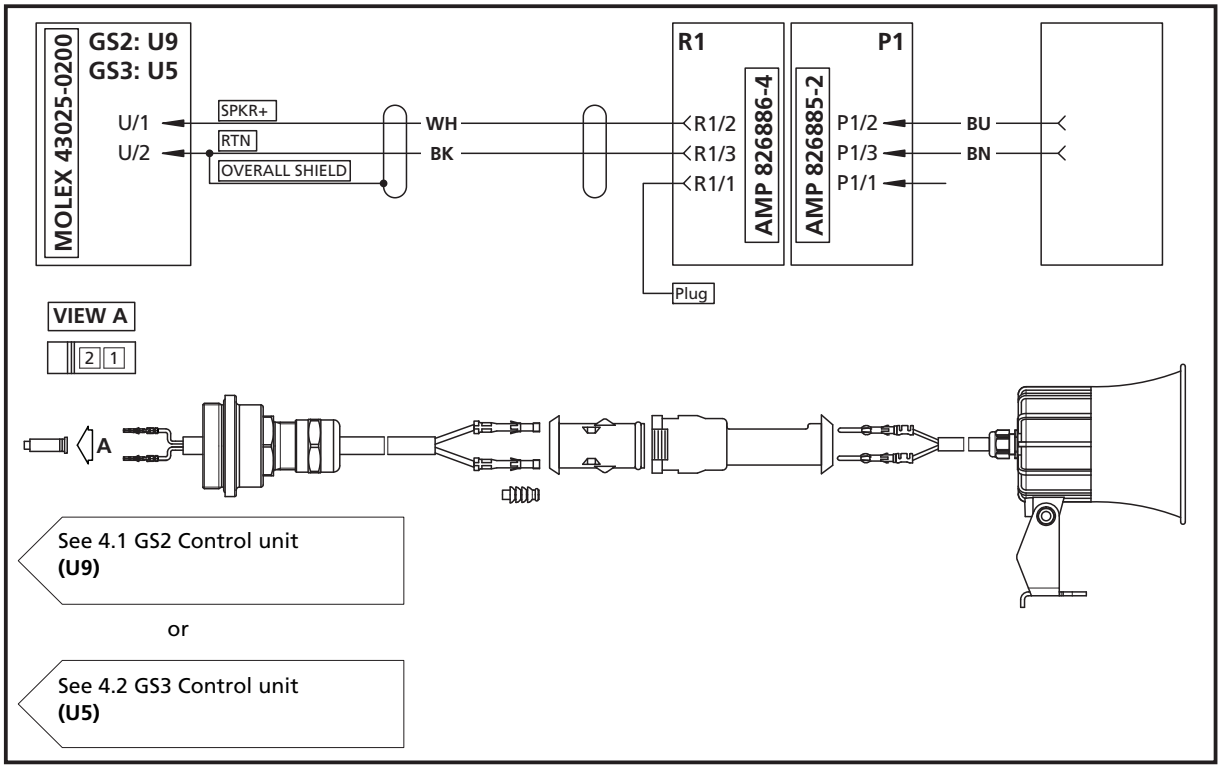
4.23 GS Multi-Pro diagnosis cable



4.24 GS Alarm horn



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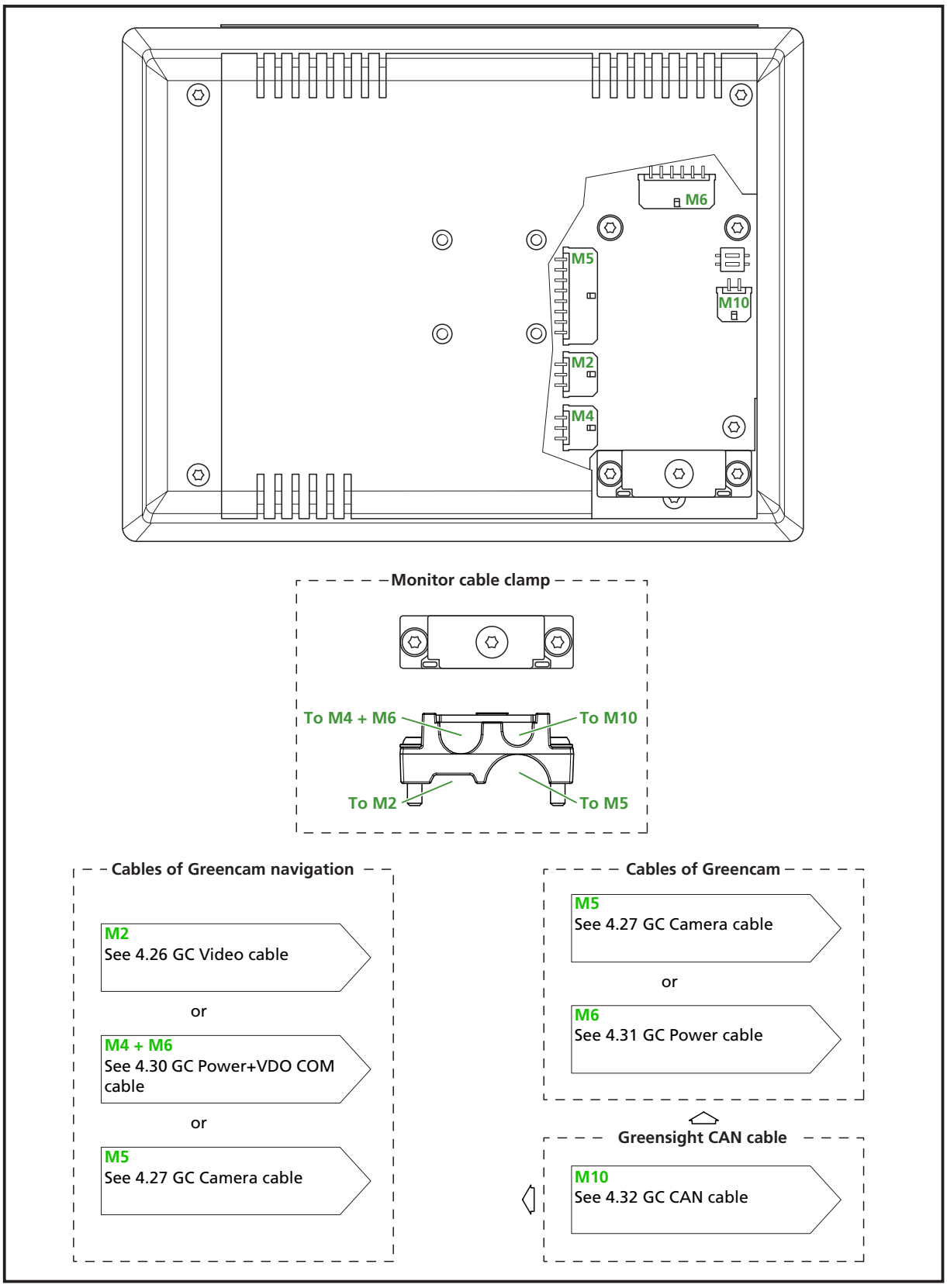
4.25 GC Monitor



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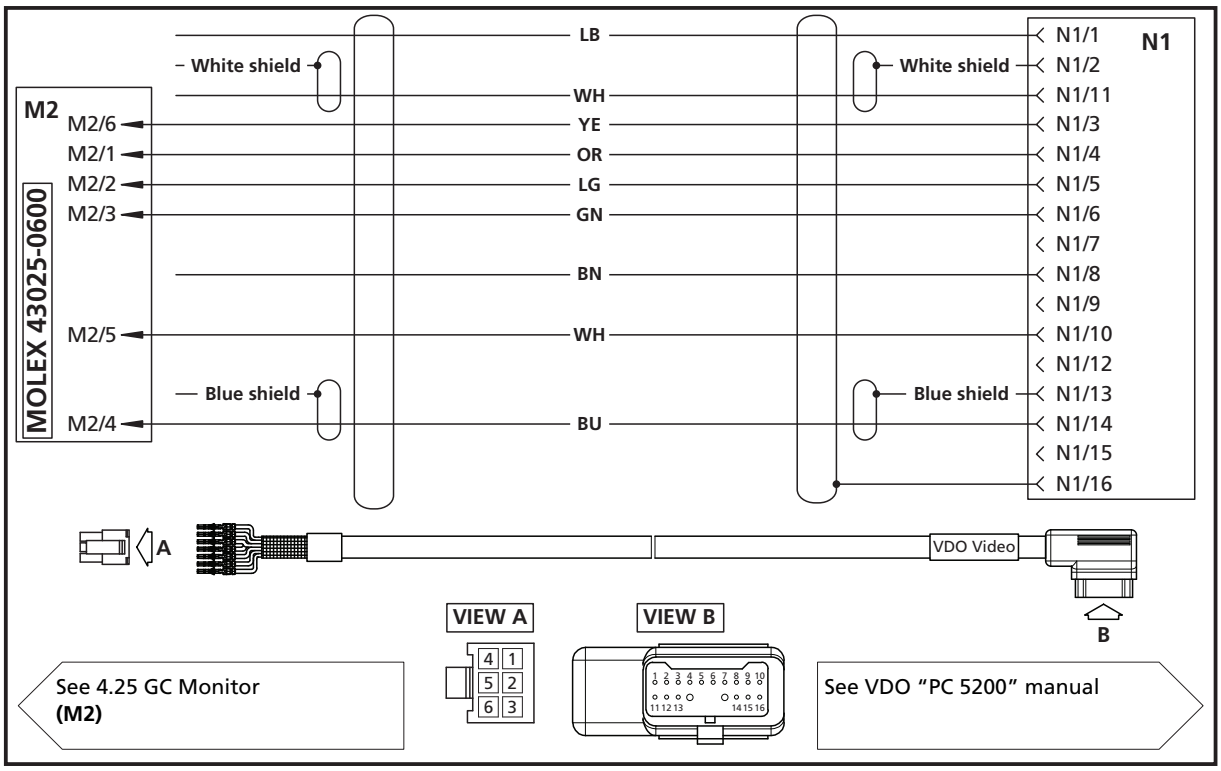
4.26 GC Video cable



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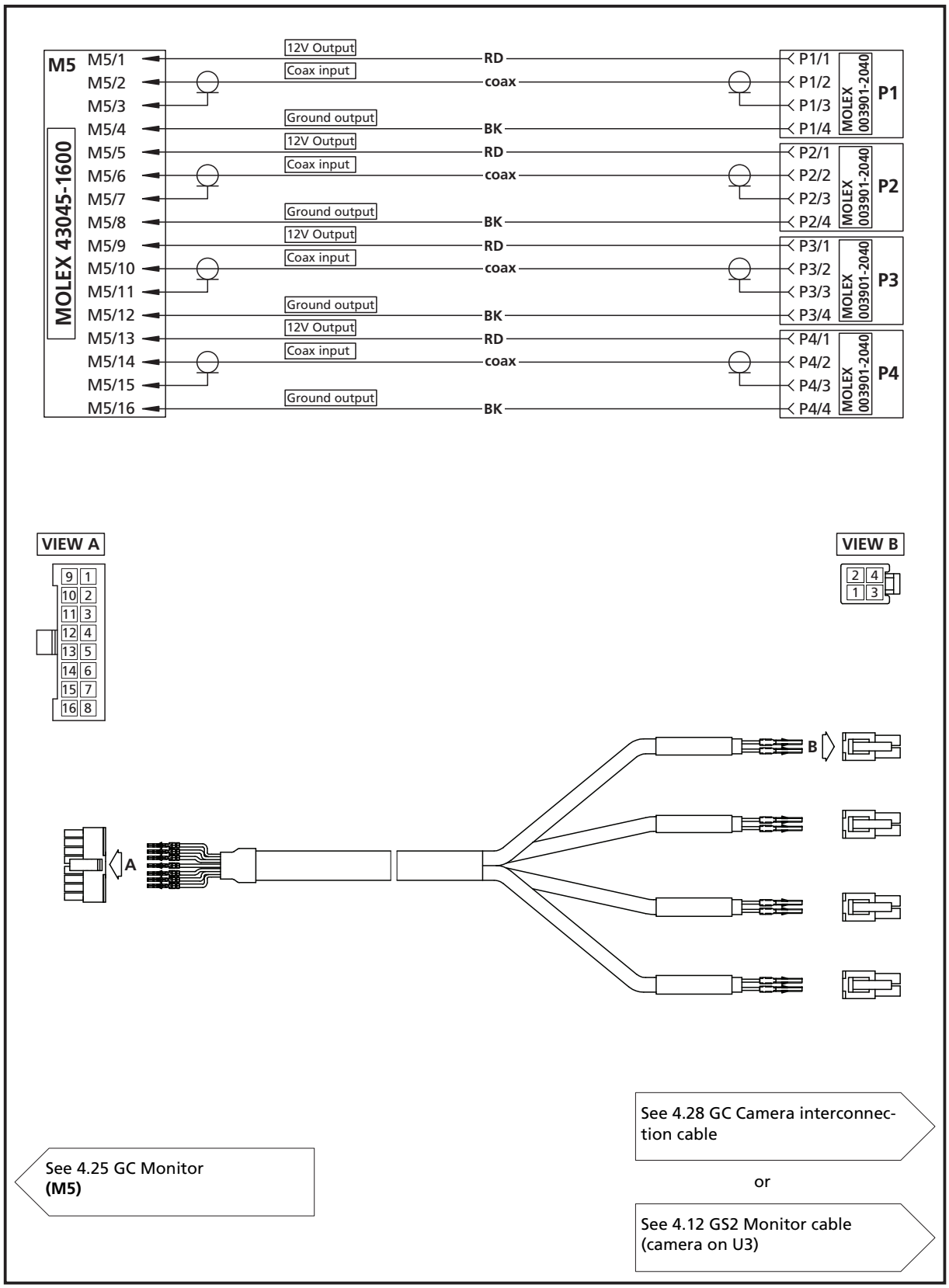
4.27 GC Camera cable



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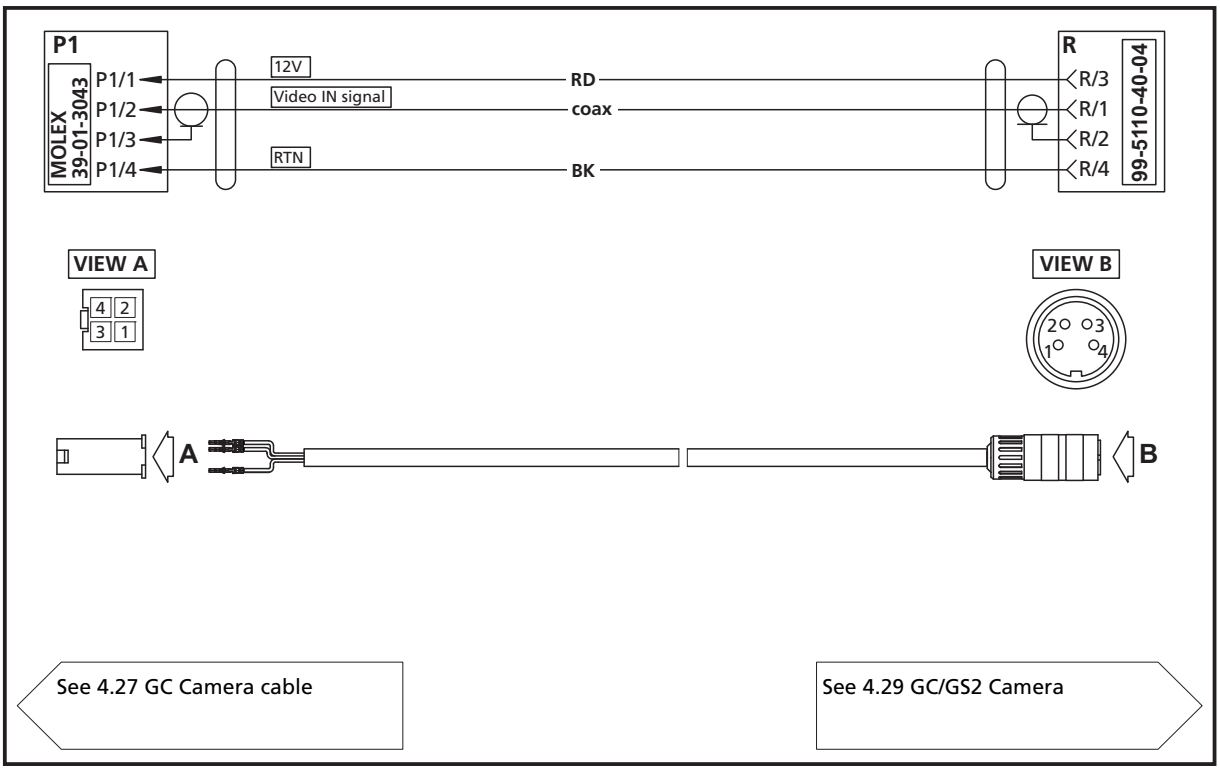
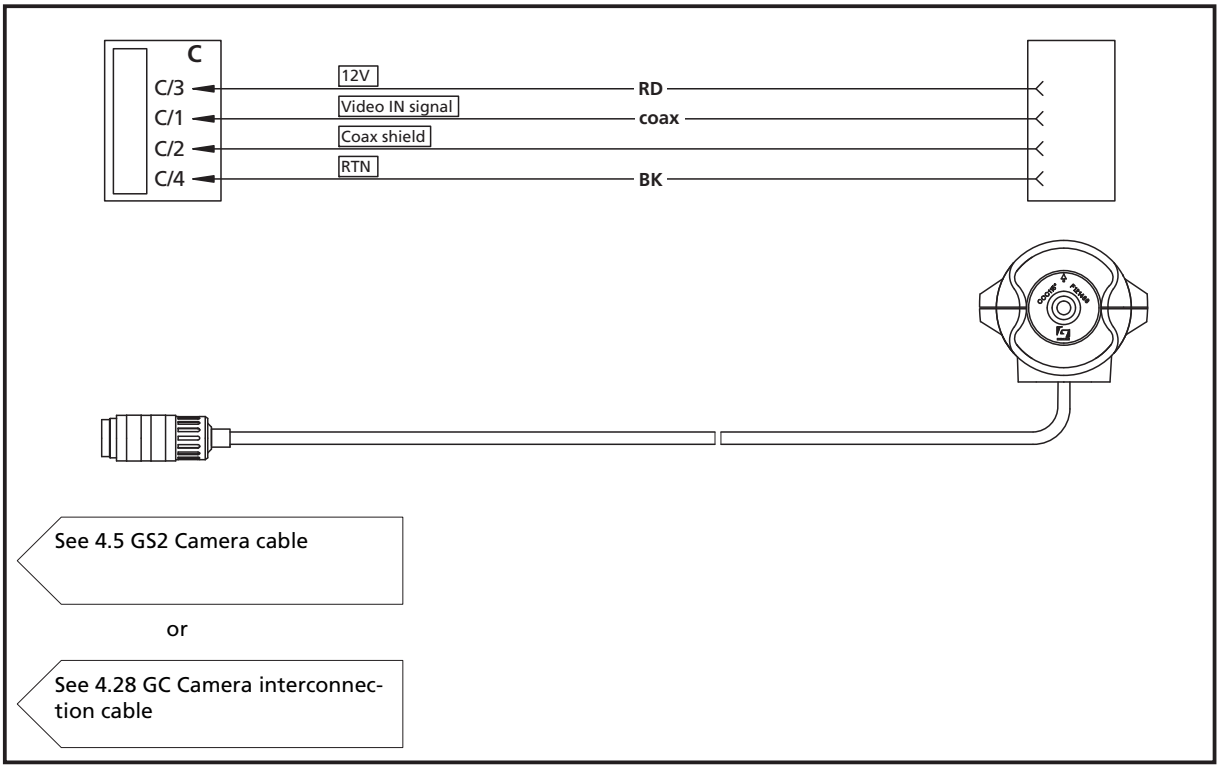
4.28 GC Camera interconnection cable



4.29 GC/GS2 Camera



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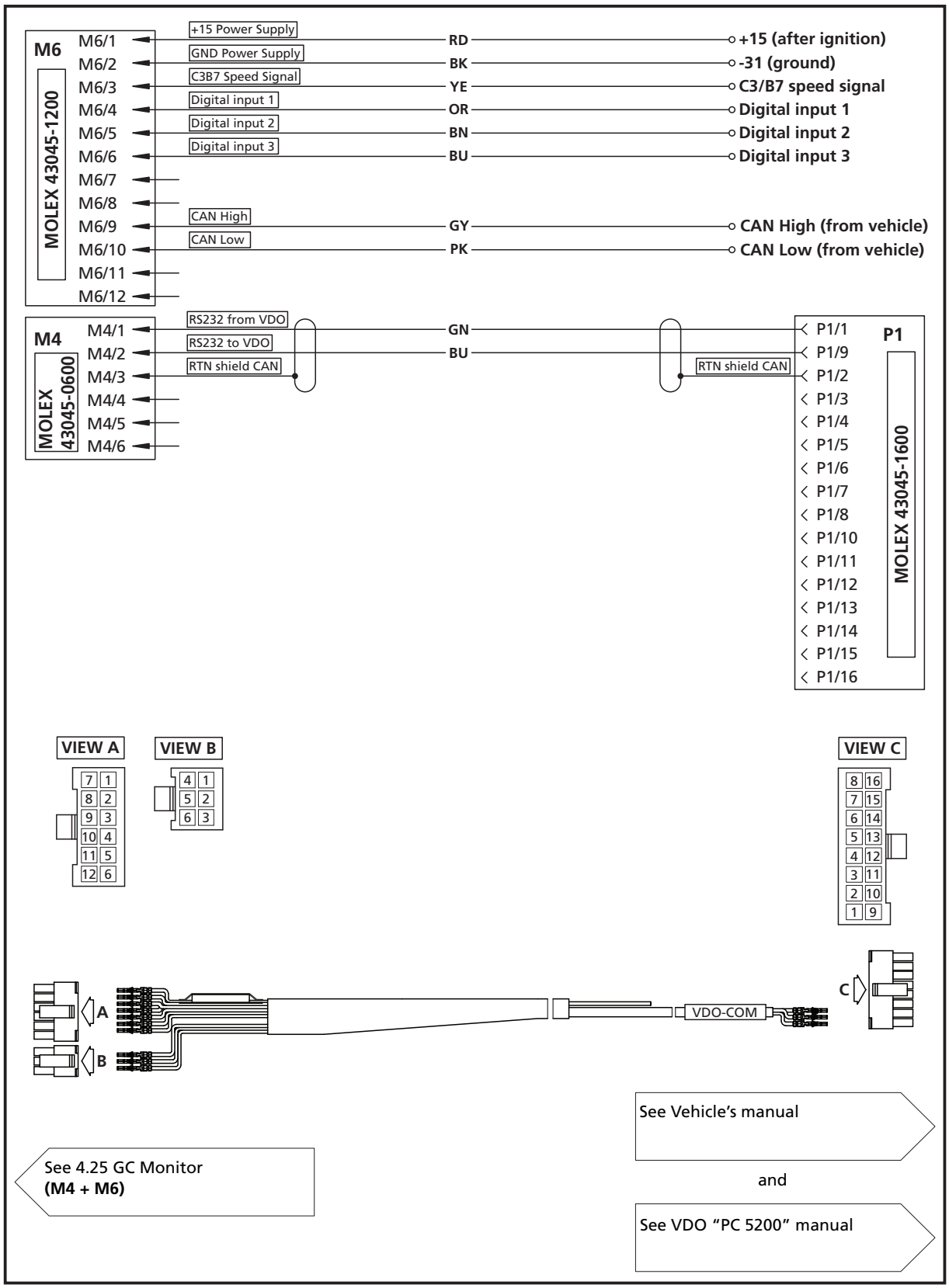
4.30 GC Power+VDO COM cable



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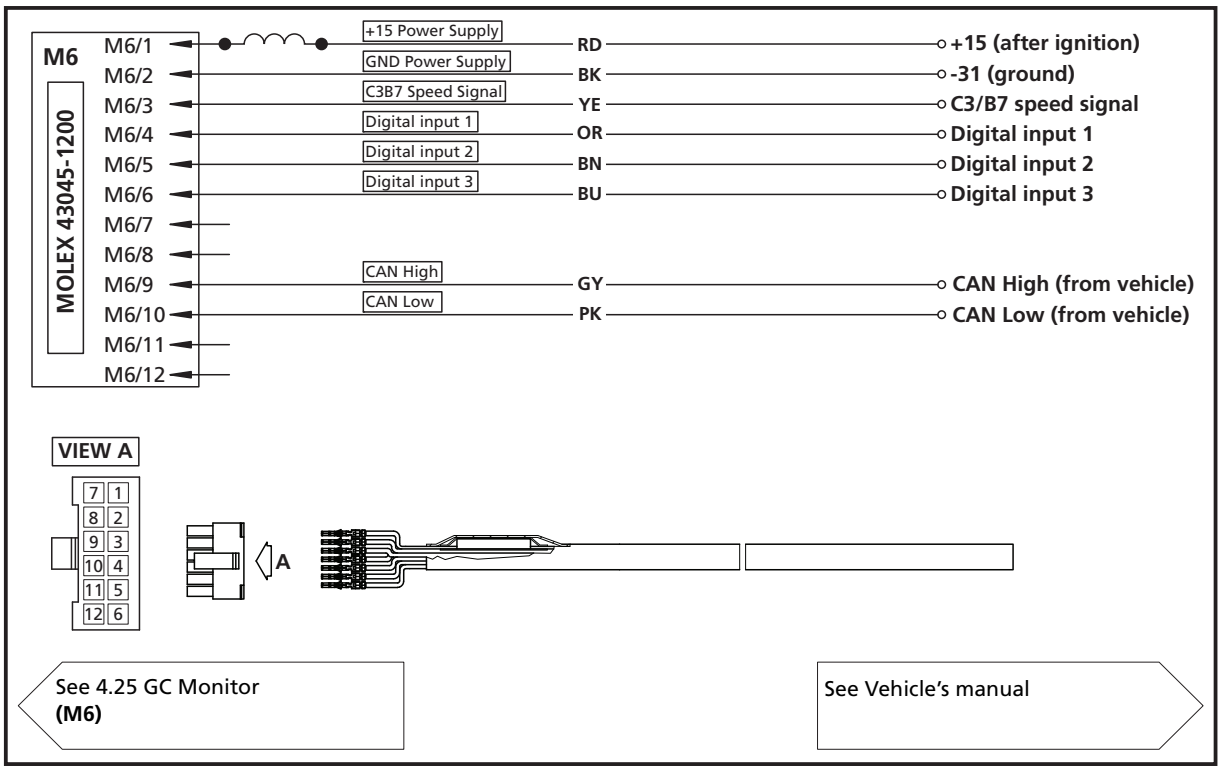
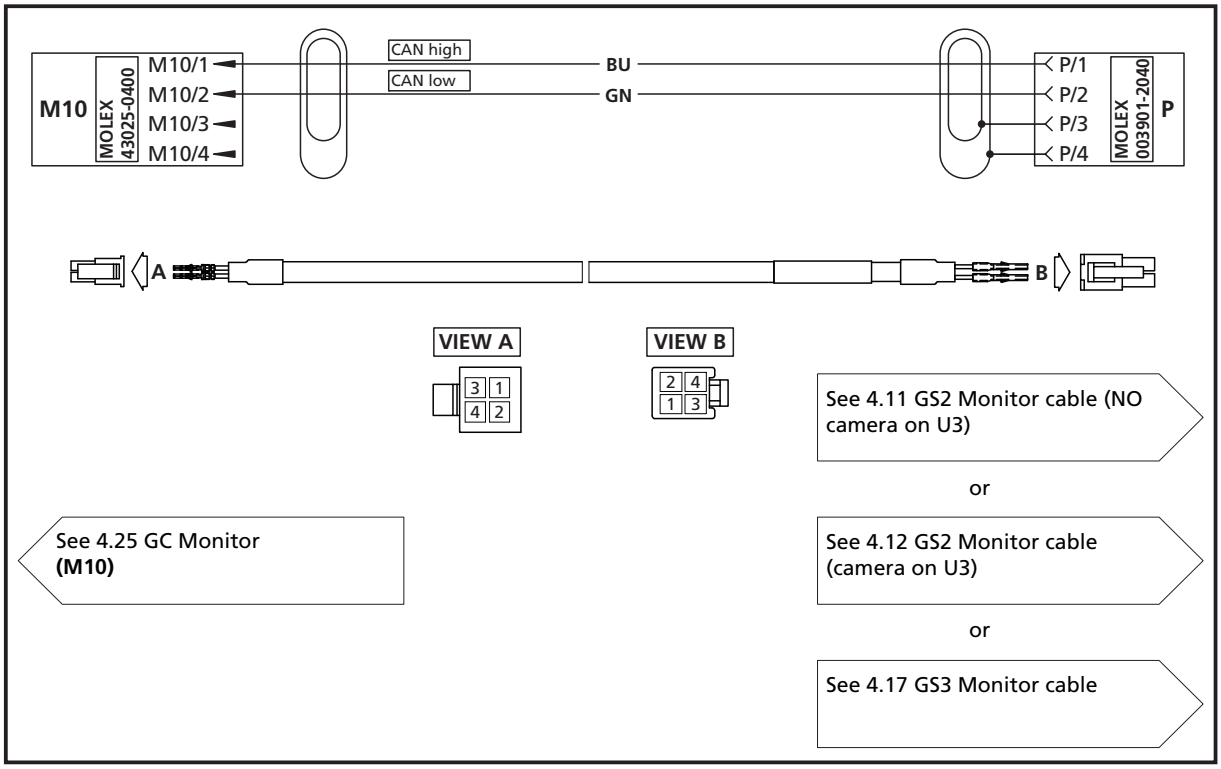
4.31 GC Power cable



4.32 GC CAN cable



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5. Calibration

5.1 Calibration (adjustment) procedure

The control units are programmed standard with the basic settings for transport applications, assuming the following characteristics.

Mounting width between sensors: 250 cm

Length of detection zones:
- Zone 1: 170 - 300 cm
- Zone 2: 70 - 170 cm
- Zone 3: 0 - 70 cm

The 0-point of the detection zone begins at the sensor, so this must be aligned with the rearmost point on the vehicle.

If the installation deviates from the assumptions above, or is being used in an off-road situation, it will be necessary to modify the parameter settings using Multi-Pro.

Multi-Pro software enables the standard parameter settings to be changed. In addition to the modification of many parameter settings, Multi-Pro is also suitable for diagnostics and testing of the system.

For the operating principles and capabilities of Multi-Pro, please see chapter 6. Multi-Pro software.

5.2 Action items following installation

1. Check the length of the detection areas.
2. Check the width of the detection areas.
3. Check the ground clearance of the detection areas.
4. If possible, test-drive the vehicle and the Greensight system.
5. If possible, give the vehicle driver instruction on the operation of the system, and how to clean it.
6. Leave the workplace clean and tidy.

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6. Multi-Pro software

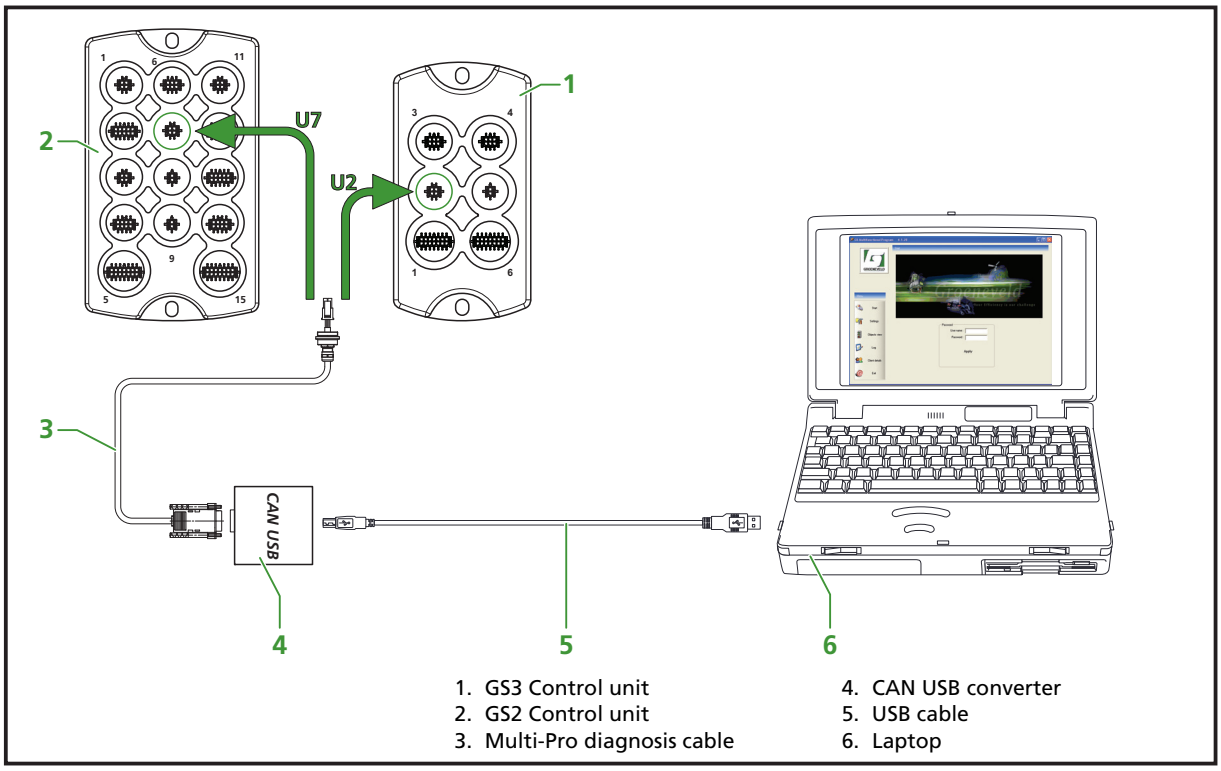
The Multi-Pro software is a programming and read out application for the control unit of Greensight.
In the following paragraphs the features and settings of the Multi-Pro software will be described.

6.1 System requirements

The system requirements are:
- PC/Laptop with Windows 2000 operating system or higher
- Multi-Pro kit

6.2 Connections

To be able to communicate with a control unit, connect the laptop to the control unit as follows:



1. GS3 Control unit
2. GS2 Control unit
3. Multi-Pro diagnosis cable
4. CAN USB converter
5. USB cable
6. Laptop

Figure 6.1 Connect a control unit to a Laptop

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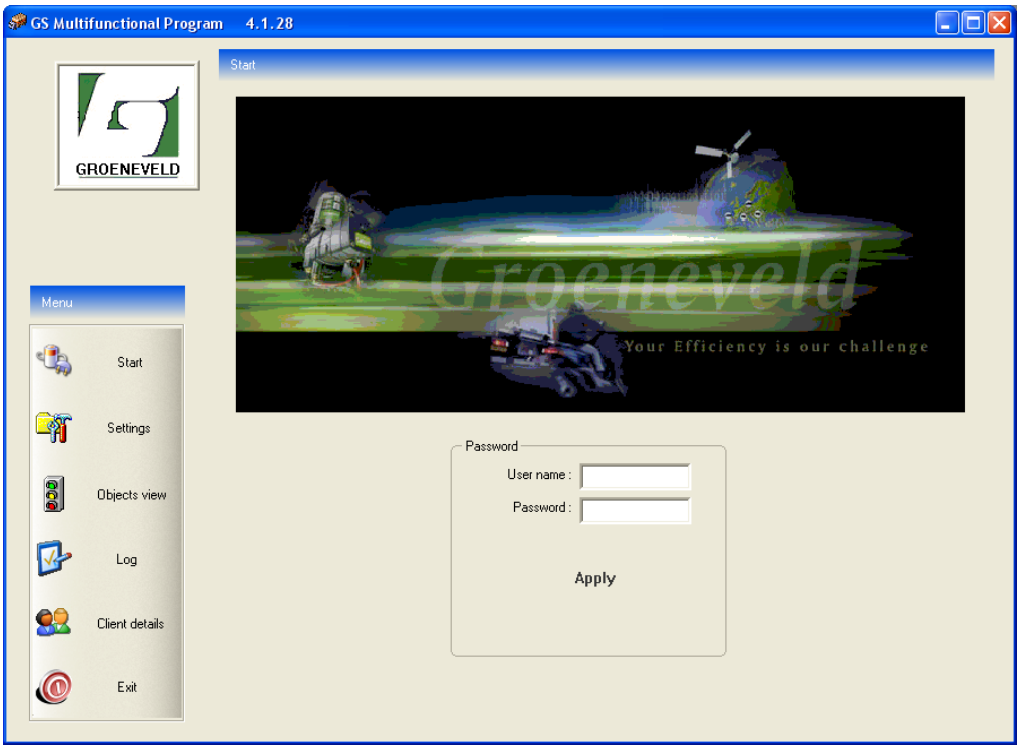
6.3 Start

When opening the Multi-Pro application the Start window appears.



NOTE
The start window can be skipped. Logging in to get full access is not needed.

The settings, objects view, log and client details are described in the following paragraphs.

6.4 Settings

By pressing the “Settings” button you will enter the settings area. In that area you can perform the following operations:

1. Send initial parameters to a control unit (factory settings);
2. Read the current parameters stored in the control unit by pressing the “Read parameters” button at the top right corner of the window;
3. Save new parameters to the internal memory of the control unit (so after the next Power up the GS will work according to the new parameters);
4. Load parameters from a file;
5. Switch between the different settings windows.

In the next paragraphs the tabs of the settings window will be explained.

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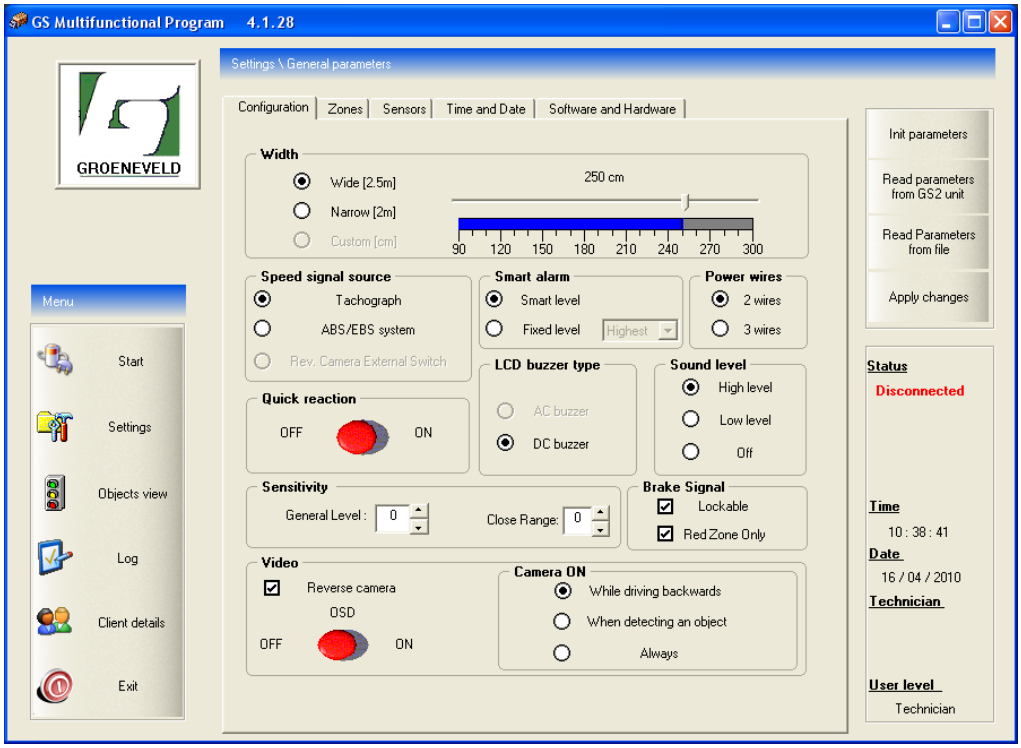
6.4.1 Configuration



Width
The truck's width. The options are: wide [2,5m], narrow [2m] or custom [90 - 300 cm].

Speed signal source
The speed signal can be obtained by the tachograph or ABS system.

Smart alarm

Smart level
The smart level automatically adjusts itself to the sound level of the direct environment.

Fixed level
With fixed level you can choose: off, low, high or highest.

Power wires
The wires of the 3 wires option are: reverse (+), ground (-31), after ignition (+15). The 2 wires option is without the after ignition wire.

2 wires
The control unit performs a complete self-test.

3 wires
When after ignition is switched on a self-test will be performed. A shortened self-test will be performed by the control unit when putting the vehicle into reverse.

Quick reaction
If the Quick reaction has been set to OFF the control unit holds the data of a detected object for a moment.

LCD buzzer type
In this field no choice can be made: always DC buzzer.

Sound level
The sound level of the LCD buzzer.

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Sensitivity
The sensitivity of the system can be changed from -10 to +10. '-10' is least sensitive and '+10' is most sensitive. With 'General Level' all zones are meant. And with 'Close Range' the 'Red Zone' is meant.

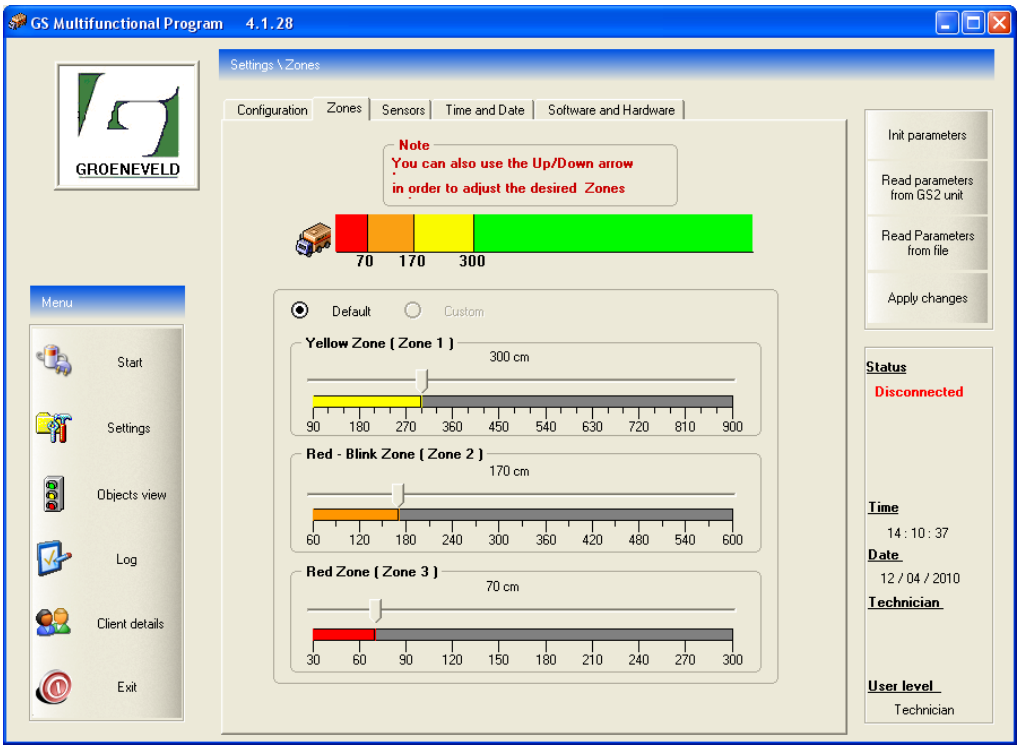
Brake signal
When 'Lockable' and 'Red Zone Only' are not selected the brake signal will be activated in all zones. Selecting only 'Red Zone Only' the brake signal will only be actived in this area. If only 'Lockable' is selected the brake signal stays active in all zones when activated until you deactivate the reverse signal. Selecting both options implies that the 'Lockable' option is applicable to the 'Red Zone Only'.

Video
Select reverse camera when installed. Set OSD to ON if another monitor or camera brand is used.

Camera ON
The moment that the reverse camera should be active: while driving backwards, when detecting an object or always.

6.4.2 Zones

The Zones tab shows the 4 signalling zones of the coverage area (900 cm).



At default mode, all sliders (red, orange and yellow) are disabled. The defaults [cm] are:
- Zone 1: 170 - 300
- Zone 2: 70 - 170
- Zone 3: 0 - 70

The control unit will not report detected objects in the green zone.

At custom mode you can set the sliders of the zones to your wishes.

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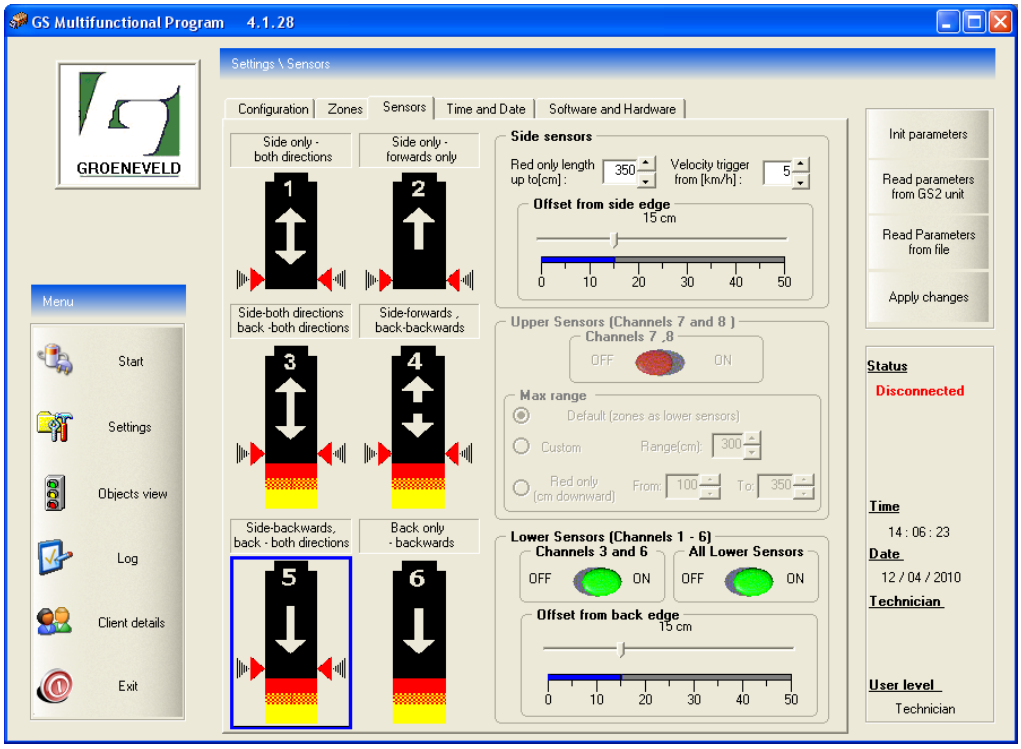
6.4.3 Sensors

The Sensors tab shows the settings of the Greensight configuration that is selected with a blue frame.



Available configurations

1. Side only-both directions
Only side sensors have been installed. These sensors have to be active when driving forward or backward.

2. Side only-forwards only
Only side sensors have been installed. These sensors have to be active only when driving forward.

3. Side-both directions, back-both directions
Side sensors have been installed. Also lower and/or upper sensors have been installed. All sensors have to be active when driving forward or backward.

4. Side-forwards, back-backwards
Side sensors have been installed and have to be active when driving forward. Also lower and/or upper sensors have been installed. These sensors have to be active when driving backward.

5. Side-backwards, back-both directions
Side sensors have been installed and have to be active when driving backward. Also lower and/or upper sensors have been installed. These sensors have to be active when driving forward and backward.

6. Back only-backwards
Lower and/or upper sensors have been installed. These sensors have to be active when driving backward.

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Side sensors

Red only length up to [cm]
The maximum detection length of the red zone.

Velocity trigger from [km/h]
The minimum velocity at which the side sensors will be activated.

Offset from side edge
The offset [cm] of the side sensors from the side of the truck.

Upper sensors (Channels 7 and 8)

Channels 7 and 8
Set the button to ON when upper sensors have been installed.

Max range
The maximum range of the upper sensors.

Available options:

Default (zones as lower sensors)
With the default option the zones of the upper sensors are identical to the lower sensors. This is the option when the upper sensors have to look backwards.

Custom
With the custom option the desirable maximum range can be set.
Range: 100-900 cm

Red only (cm downward)
Choose the Red only option if the upper sensors are looking down. The coverage area of the red only mode can be set.
Range: 0-400 cm

Lower sensors (Channels 1 - 6)

Channels 3 and 6
Set the button to OFF when the channels 3 and 6 of the installed lower sensors should stay inactive.

All lower sensors
Set the button to ON when lower sensors have been installed.

Offset from back edge
The offset [cm] of the lower sensors from the back of the truck.

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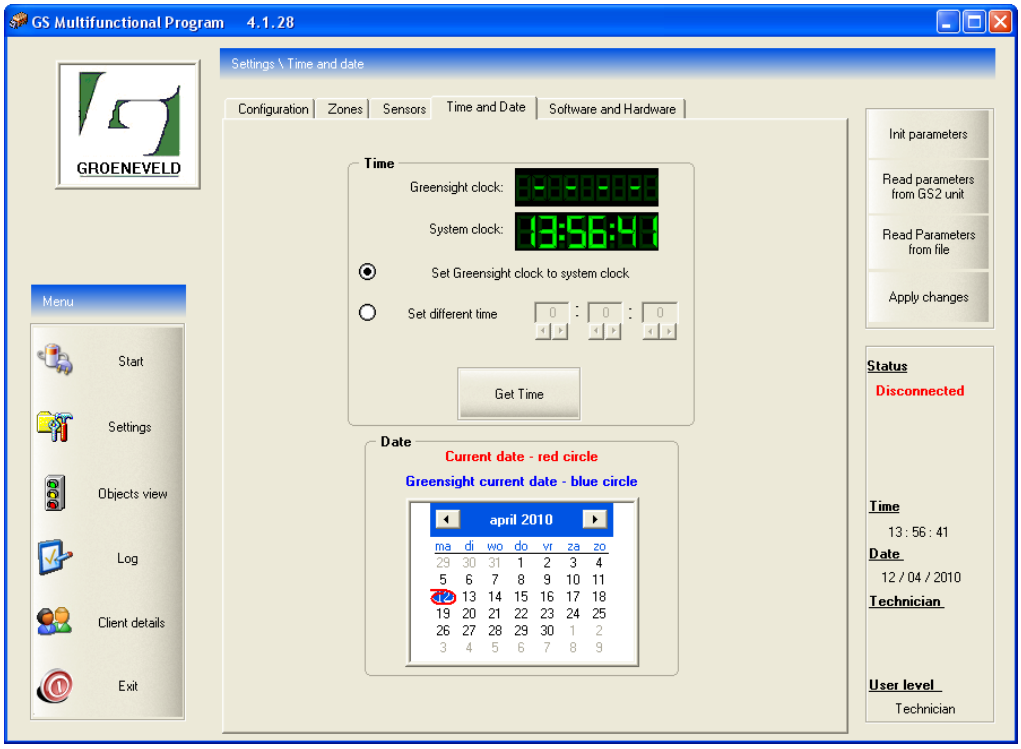
6.4.4 Time and Date

The tab shows how the Time and Date of the control unit has been and can be set.



Set Greensight clock to system clock
With this option the time and date of the control unit will be the same as the laptop/PC.

Set different time
The time and date can be set to your wishes.

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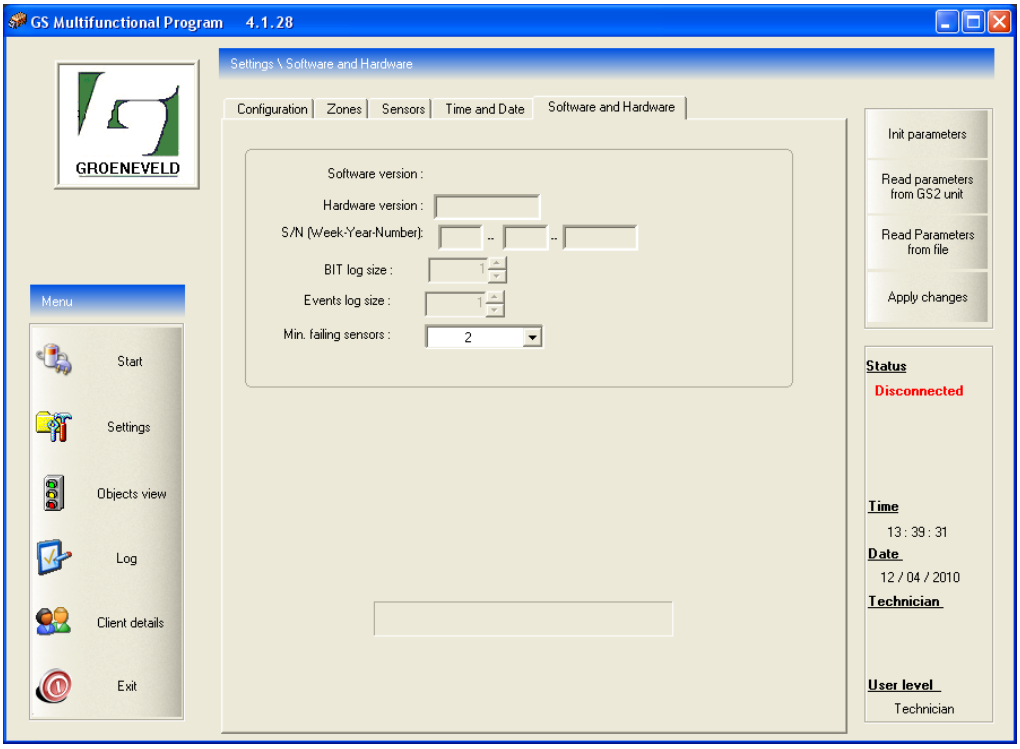
6.4.5 Software and Hardware

The tab shows the soft- and hardware data of the control unit.



Software version
The software version of the control unit.

Hardware version
The hardware version of the control unit.

S/N (Week-Year-Number)
The serial number of the control unit expressed in week, year and number.

BIT log size
The number of entries at the BIT log file.

Events log size
The number of entries at the Detection history log file.

Min. failing sensors
This parameter determines when the system stops working. Set this parameter to 2 means that the control unit will stop working when there are at least 2 failing sensors.

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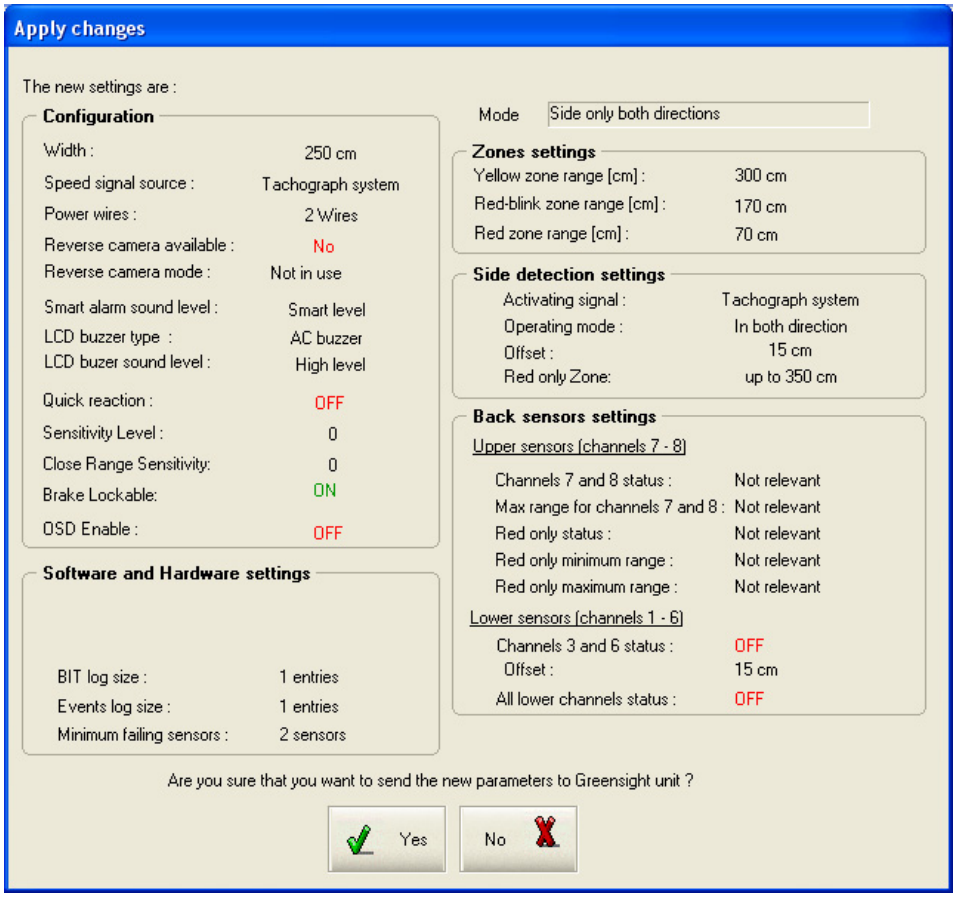
6.4.6 Apply changes

In the Apply changes window you can see a short description of all parameters.


Apply changes
The new settings are :
Configuration
Width : 250 cm
Speed signal source : Tachograph system
Power wires : 2 Wires
Reverse camera available : No
Reverse camera mode : Not in use
Smart alarm sound level : Smart level
LCD buzzer type : AC buzzer
LCD buzer sound level : High level
Quick reaction : OFF
Sensitivity Level : 0
Close Range Sensitivity: 0
Brake Lockable: ON
OSD Enable : OFF
Software and Hardware settings
BIT log size : 1 entries
Events log size : 1 entries
Minimum failing sensors : 2 sensors
Mode Side only both directions
Zones settings
Yellow zone range [cm] : 300 cm
Red-blink zone range [cm] : 170 cm
Red zone range [cm] : 70 cm
Side detection settings
Activating signal : Tachograph system
Operating mode : In both direction
Offset : 15 cm
Red only Zone: up to 350 cm
Back sensors settings
Upper sensors (channels 7 - 8)
Channels 7 and 8 status : Not relevant
Max range for channels 7 and 8 : Not relevant
Red only status : Not relevant
Red only minimum range : Not relevant
Red only maximum range : Not relevant
Lower sensors (channels 1 - 6)
Channels 3 and 6 status : OFF
Offset : 15 cm
All lower channels status : OFF
Are you sure that you want to send the new parameters to Greensight unit ?
Yes
No

Press 'Yes' to save these parameters and to set the control unit to process the data according to the new parameters. (Otherwise the control unit will work according to the old parameters after the next reset).

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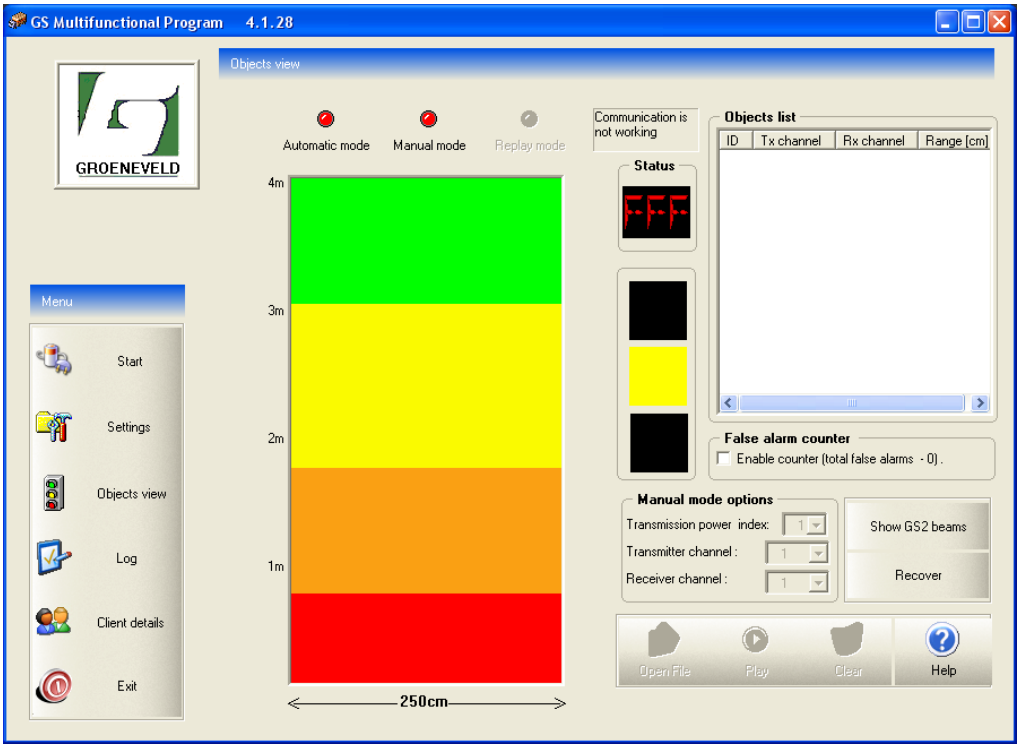
6.5 Objects view

In this window the hard- and software functionality can be tested.



This window contains a graphic display of the coverage area (according to the selected zones). In the coverage area you can see all the targets detected by the control unit.

6.5.1 Two types of targets

Most Important Object (MIO)
This is the closest and dangerous target (1 per cycle). The MIO target will appear inside the coverage area, in the appropriate position, as a black icon (black circle with white frame), with a target ID below the icon.

Regular target
A regular target is a target which is not a MIO target (up to 5 regular targets per cycle). A regular target will appear inside the coverage area , in the appropriate position, as a gray icon (gray circle with white frame), with a target ID below the icon.

The details about a specific target can be seen in the objects list at the row with the matching target ID.

6.5.2 Simulation in-cab display

In addition the real in-cab display is simulated (by means of LED's and 7SEG display). The 7SEG display will alert about errors in the system and the LED's will alert about the current zone of the MIO (if there is no MIO – a green LED will be ON).

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6.5.3 Working modes

Automatic mode
Greensight is working in automatic mode.

Manual mode
In this mode you can select the Rx channel, Tx channel and the transmission power (for development purpose only). This option will only be available in the administrator level.

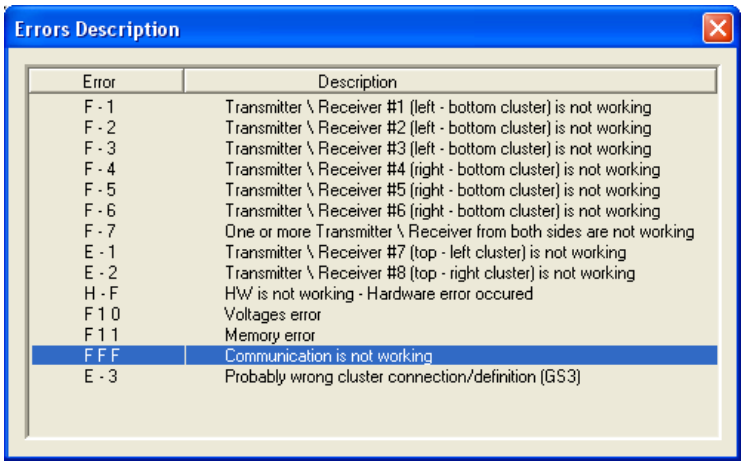
Replay mode
Not available

6.5.4 "Recover" message

A "Recover" message can be send to the control unit in order to let the Greensight working continuously (despite the errors detected in the self test).
This option is only available in the administrator level.

6.5.5 Error codes

When an error occurs in the GS system an error code appears in the Object View window. If you want to know what the meaning is of the error code press the "Help"-button.
The Errors Description window appears.


Errors Description
Error
Description
F - 1
Transmitter \ Receiver #1 (left - bottom cluster) is not working
F - 2
Transmitter \ Receiver #2 (left - bottom cluster) is not working
F - 3
Transmitter \ Receiver #3 (left - bottom cluster) is not working
F - 4
Transmitter \ Receiver #4 (right - bottom cluster) is not working
F - 5
Transmitter \ Receiver #5 (right - bottom cluster) is not working
F - 6
Transmitter \ Receiver #6 (right - bottom cluster) is not working
F - 7
One or more Transmitter \ Receiver from both sides are not working
E - 1
Transmitter \ Receiver #7 (top - left cluster) is not working
E - 2
Transmitter \ Receiver #8 (top - right cluster) is not working
H - F
HW is not working - Hardware error occured
F 1 0
Voltages error
F 1 1
Memory error
F F F
Communication is not working
E - 3
Probably wrong cluster connection/definition (GS3)

The highlighted row is the reported error.
For example, the error above says that there is no communication between the laptop and the control unit.

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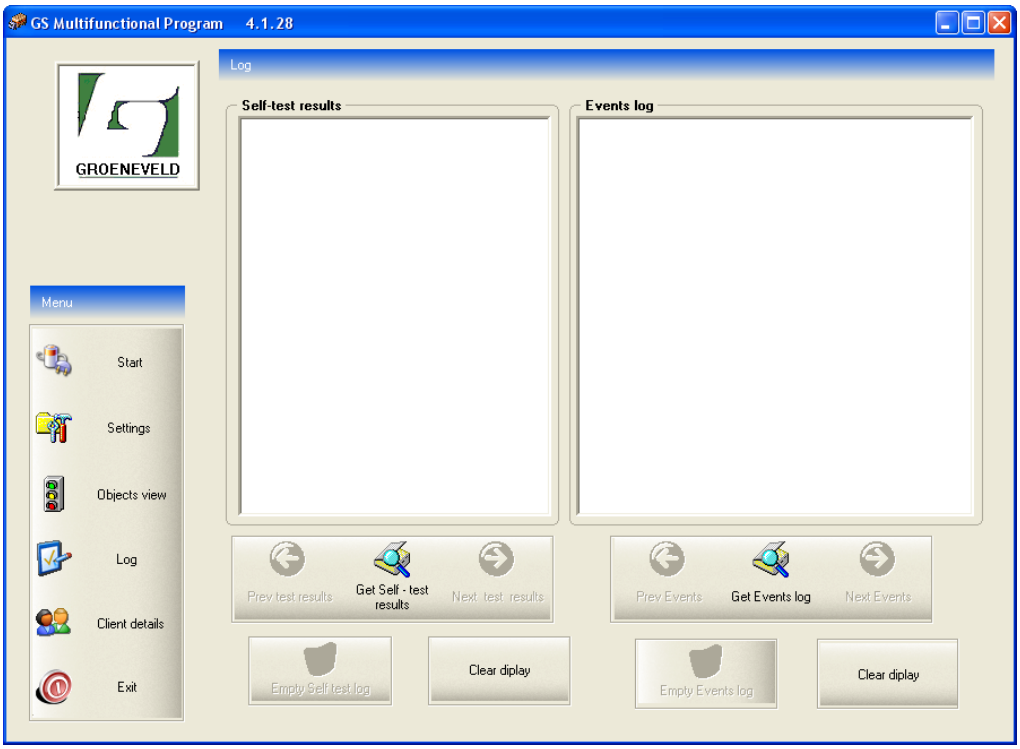
6.6 Log

In this window you can read log files of the internal memory of the control unit.



Self-test results
The results of the last X self tests (X defined by the entries of the Self test log file).
A successful self-test will be written in green color. A failed self-test will be written in red color.

Events log
The detection history of the last X seconds (X defined by the entries of the Events log file).

The content of the self test and events log files can also be deleted.

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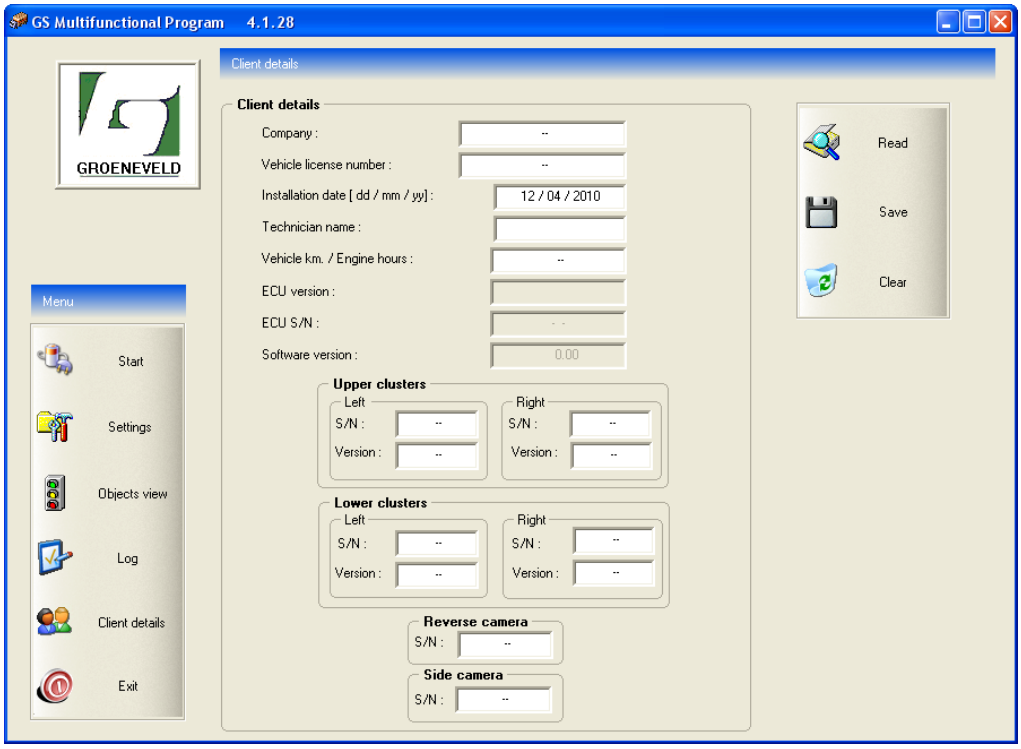
6.7 Client details

In this window you can read/fill all required details of the client company and the installed system in order to complete the installation.



Client's details will be written to the internal memory of the control unit.

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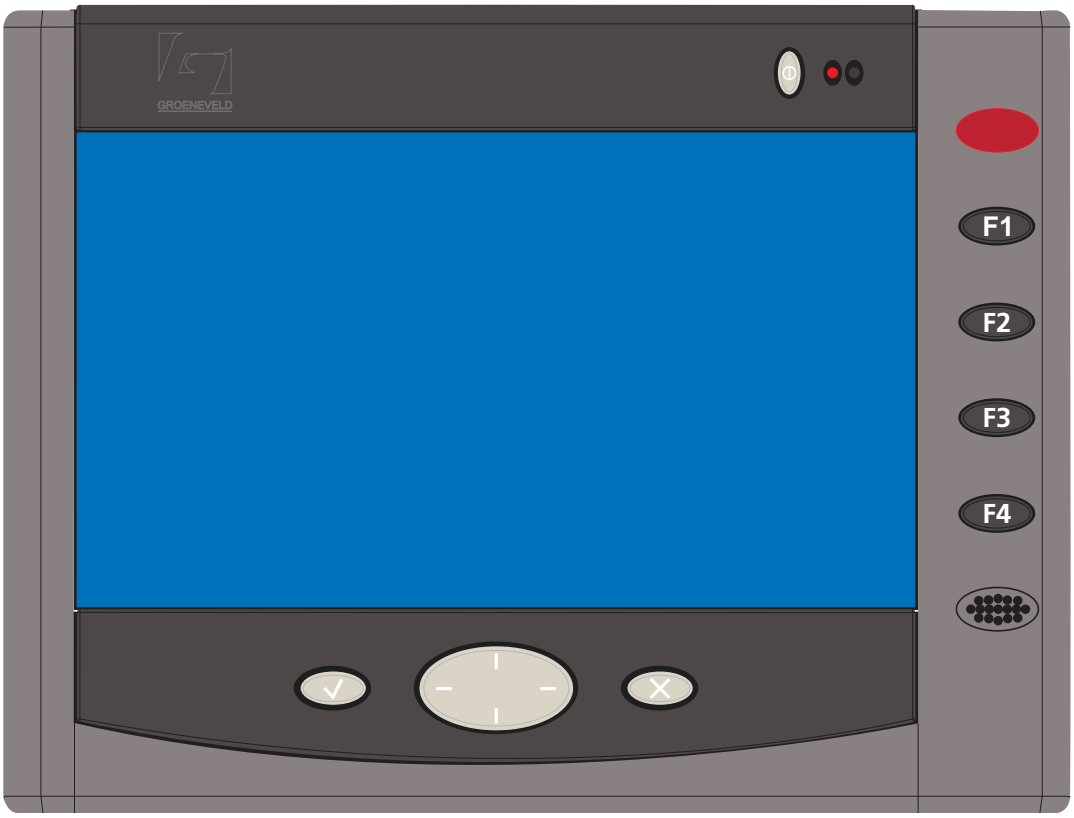
7. Greencam monitor

7.1 General



Power LED

Light sensitivity sensor

Infra red sensor for navigation remote control

Buzzer

With the standby key the monitor can be put into "sleepmode". Press again and the monitor is activated.

The key is used to confirm your adjustment(s). And to enter the modify field.

The cancel key is used to go one step back or cancel a change.

With the multi purpose key one can scroll through the settings.
The value will increase by pressing ‘up’ and ‘right’ and decrease by pressing ‘down’ and ‘left’.
Pressing the key ‘up’ or ‘down’ changes the value with steps of 0.1 or 1. Pressing the key ‘left’ or ‘right’ changes the value with steps of 1 or 10.

F1 - F4 The function of the F-keys can be set to your wishes. With the function keys a camera, navigation or a dual, triple or quad screen can be selected.

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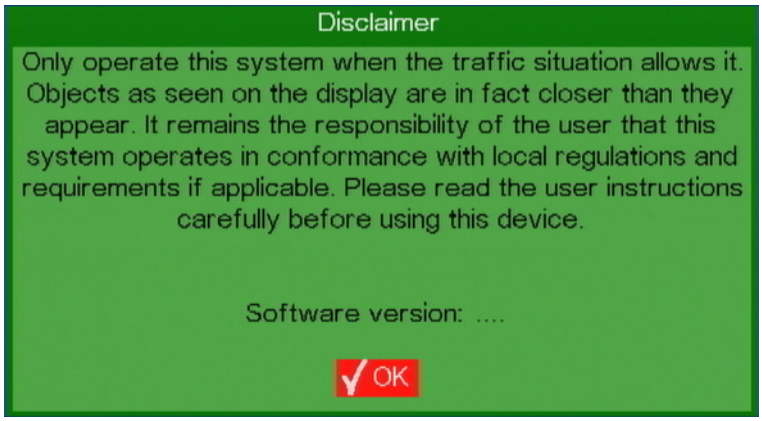
7.2 Switching on the monitor

When the monitor switched on and starting up the disclaimer below appears:


Disclaimer
Only operate this system when the traffic situation allows it. Objects as seen on the display are in fact closer than they appear. It remains the responsibility of the user that this system operates in conformance with local regulations and requirements if applicable. Please read the user instructions carefully before using this device.
Software version: ....
OK

Depending on the settings the monitor activates a view or turns to sleepmode.

7.2.1 View options

You can choose your own view manually with one of the F-keys (if activated).
After pressing it is possible choose a view with the multi purpose key (left / right).

LCD settings
To enter the LCD settings press the multi purpose key (up / down). Now you can lower or increase the temporary brightness or contrast by pressing the multi purpose key (left / right). Press to confirm or to cancel.

ATTENTION
When the power is switched off the temporary brightness and contrast settings will be lost.

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7.3 User menu

7.3.1 Main menu

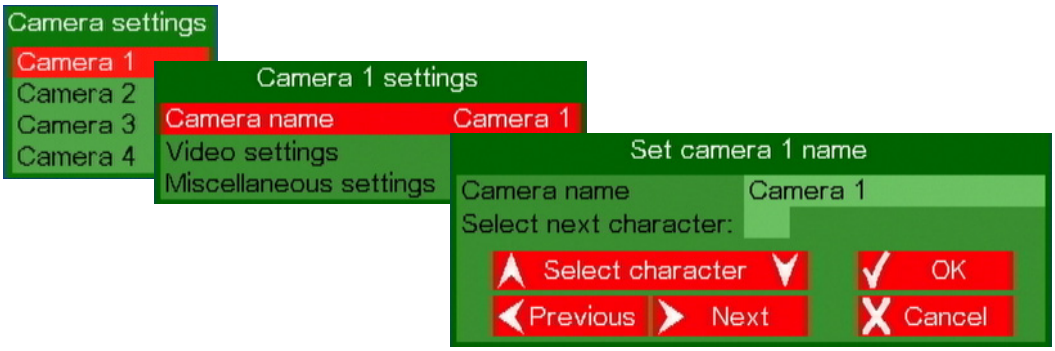
After pressing again the main menu shows up.
Select with the multi purpose key the settings you want to change. Press to confirm your selection.

ATTENTION
To be able to set the Camera and F-key settings you have to set the System settings first!

7.3.2 Camera settings

Camera 1 settings

It is possible to change the camera name.



Explanation of button usage for entering a name:

- A character can be selected when pressing up/down with the multi purpose key.
- Pressing at the left side of the multi purpose key the previous character can be entered.
- Pressing at the right side of the multi purpose key the next character can be entered.
- Press to confirm and to cancel.

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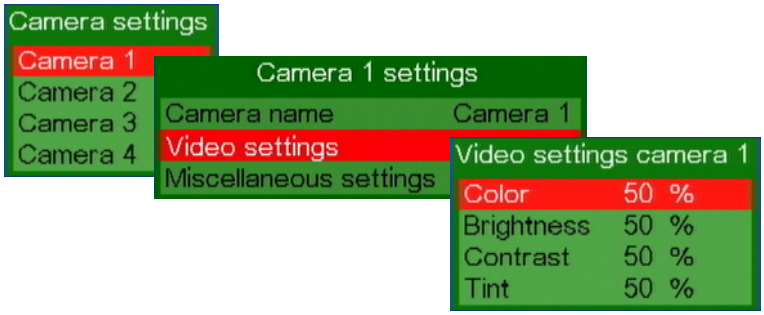
Video settings

Camera 1, 2, 3 and 4 needs to be set separate from each other. The camera you want to set, appears on the monitor.



Color
The degree in which the camera has to transmit colors.

Brightness
The degree in which the camera has to radiate or reflect light.

Contrast
The difference in visual properties that makes an object distinguishable from other objects and the background.

Tint
The tint is the degree of color strength.
Range of the video settings: 0 - 100%

Miscellaneous settings

Allow navigation box
Press 'Yes' if the navigation arrows have to be visualized together with the active camera view (e.g. when the driver is turning left or right).

Horizontal line position
Only for the reverse camera a horizontal line can be set. When driving backward the horizontal line shown on the reverse camera can be helpful to manoeuvre the vehicle to a certain distance of a chosen object.

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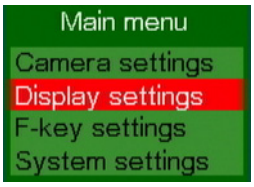
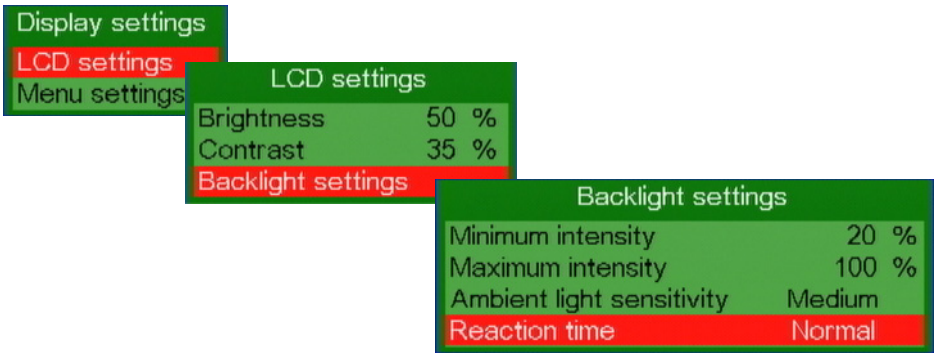
7.3.3 Display settings



LCD settings

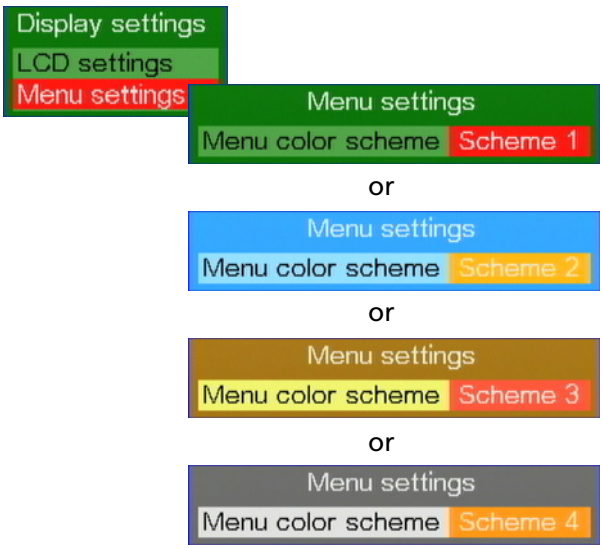
The LCD settings consist of brightness, contrast and backlight settings. The backlight settings are subdivided into minimum intensity, maximum intensity, ambient light sensitivity and reaction time.



The range of brightness is: 15-85%.
The range of contrast is: 5-95%.
The minimum intensity range is: 10-100%.
The maximum intensity range is: 20-100%.
The options for ambient light sensitivity are: lowest, low, medium, high and highest.
For the reaction time the options are: very slow, slow, normal, fast or very fast.

Menu settings

In menu settings four color schemes can be chosen.



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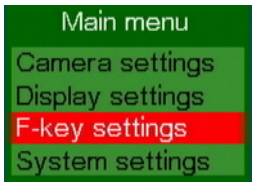
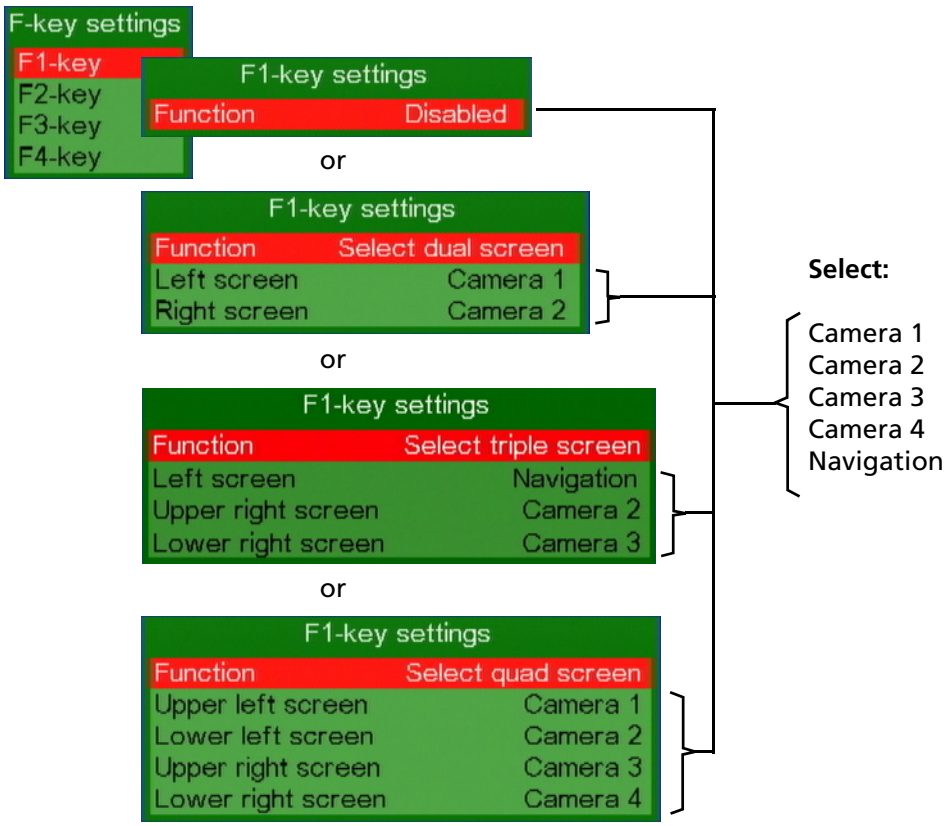
7.3.4 F-Key settings



The function of the buttons F1 to F4 can be adapted to your wishes. Supposing all camera's and navigation are connected the following options are possible: Disabled, Camera 1 to 4, Navigation, Dual, Triple or Quad screen.

If you prefer a Dual, Triple or Quad screen for a specific F-Key a selection can be made for each screen position. The options are: Camera 1 to 4 and Navigation.



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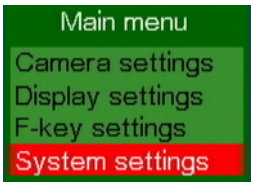
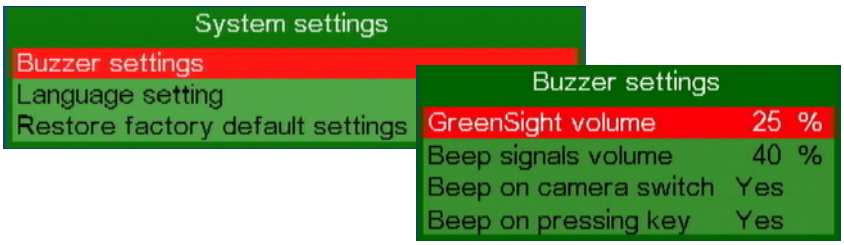
7.3.5 System settings



Buzzer settings



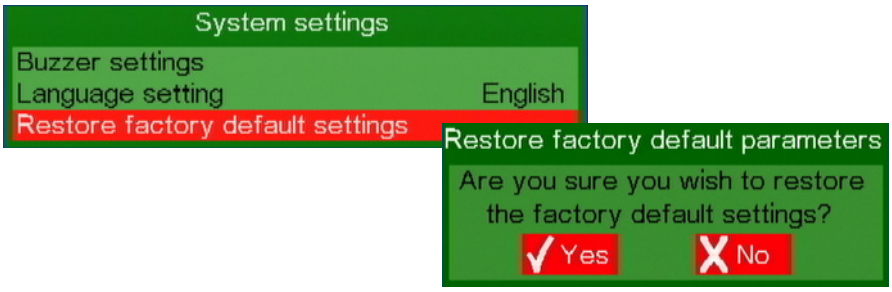
Greensight volume
With this option the Greensight volume can be set depending on whether the Greensight is connected.
Range: 15 - 100%

Beep signals volume
With this option the volume of the beep signals can be set, but not lower than the set minimum GreenSight volume.
Range: 10 - 100%

Beep on camera switch
Set this option to 'Yes' if you want to hear a beep when the Greensight switches to another camera.

Beep on pressing key
Set this option to 'Yes' if you want to hear a beep when pressing a monitor key.

Other system settings



Language setting
With language setting the preferred language can be set.

Restore factory default settings
When you select this option all your personal settings will be lost.

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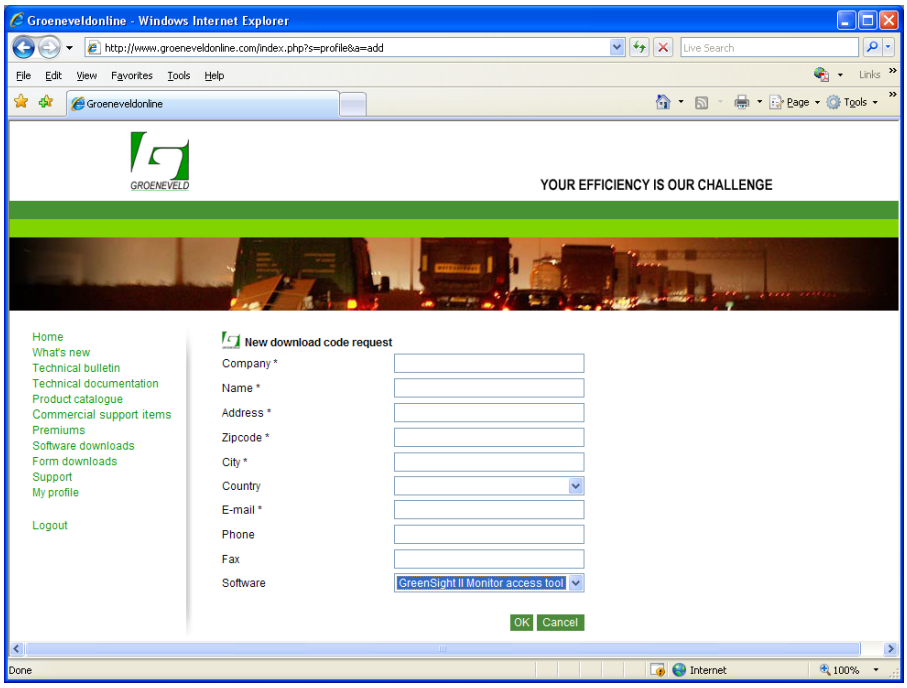
7.4 Mechanic menu

7.4.1 Access to monitor adjustments

Getting the access tool

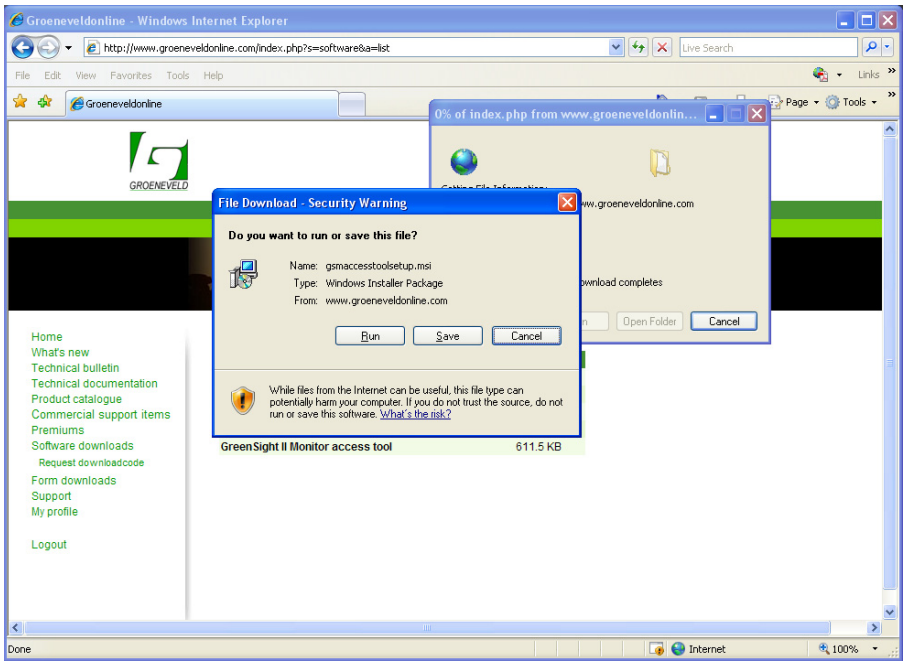
Download code request

If you do not have already the download code, please fill in the form below. This form can be obtained by clicking Software downloads>Request downloadcode.



Download the monitor access tool

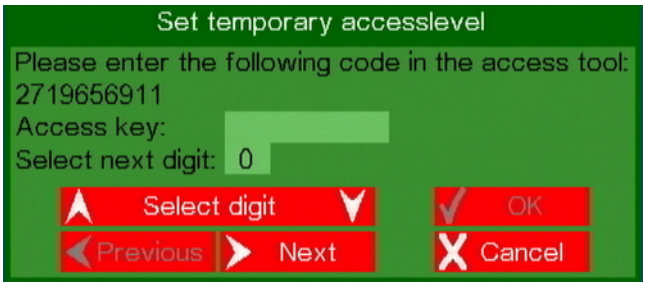
To be able to adjust the monitor settings the monitor access tool has to be downloaded. During installation you will be asked for a serial number. Enter the requested code.


Groeneveldonline - Windows Internet Explorer
http://www.groeneveldonline.com/index.php?s=software&a=list
File Download - Security Warning
Do you want to run or save this file?
Name: gsmaccesstoolsetup.msi
Type: Windows Installer Package
From: www.groeneveldonline.com
Run
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. What's the risk?
GreenSight II Monitor access tool
611.5 KB
Request downloadcode
Done
Internet
100%

Monitor adjustment access procedure

Before starting the procedure the screen should appear as 'blue'. If this is not the case press ⏻ till the blue screen appears.

1. Press ✓ , ✗ , F1 and F4 simultaneously. The following screen appears.



2. Open the Greensight Monitor access Tool on your desktop.
3. Enter the displayed code '2719656911' into the access tool.

4. Press Generate Key. Your key is '1463456375'.

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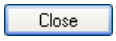
5. Enter your key '1463456375' with .

6. Confirm with .
7. When the entered code is correct the following screen appears.

8. Press .

If the 'Code invalid' screen appears repeat step 1 to 7 again.

9. Press 

and of the Greensight Monitor Access Tool.

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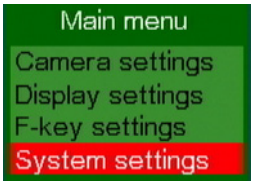
7.4.2 Main menu

After pressing ✓ again the main menu shows up.
Select with the multi purpose key the settings you want to change. Press ✓ to confirm your selection.

ATTENTION
To be able to set the Camera and F-key settings you have to set the System settings first!

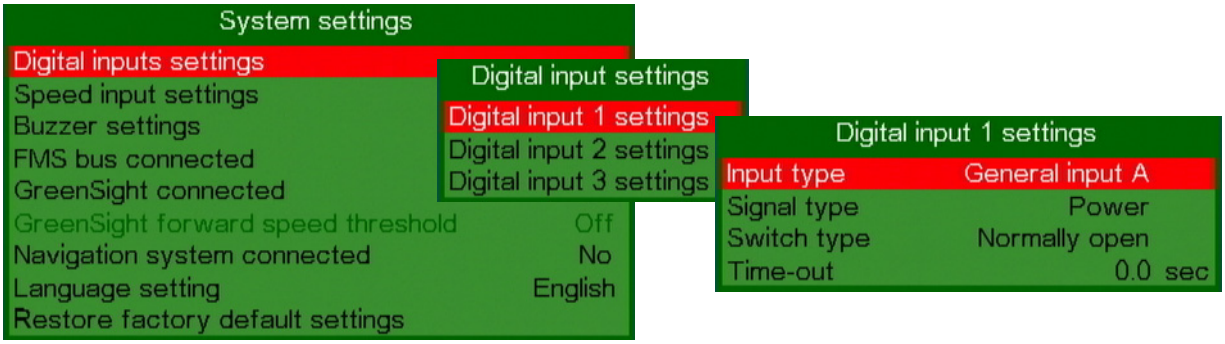
7.4.3 System settings



ATTENTION
Be sure all components and required vehicle signals are proper connected, before adjusting the monitor system settings!

Digital input settings

Three digital inputs can be set.



Input type
The digital inputs can be obtained by a general input A (B or C), the handbrake, a direction blinker (right or left), the reversing signal or input disabled.

Signal type
The signal type can be set to 'power' or 'ground' depending on how the wires are connected.

Switch type
The switch type can be set to 'Normally open' or 'Normally closed'.

Time-out
The time-out can be set when you did choose for a general input or a direction blinker. These input types do have an intermittent signal. To get a continuous signal the time-out can be set.
Range: 0.0-60.0

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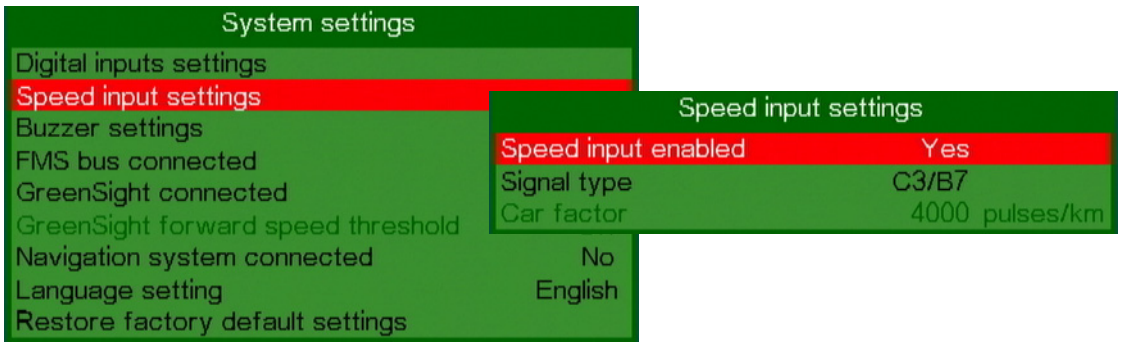
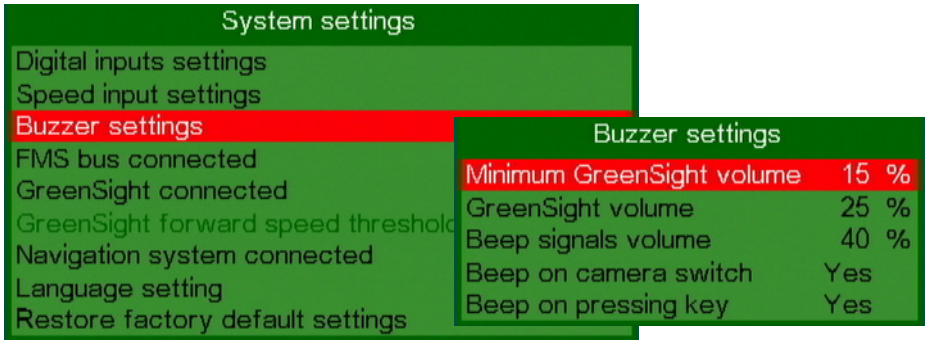
Speed input settings



Signal type
The speed signal can be generated in two ways: by tachograph (C3/B7) or pulse transmitter signal.

Car factor
The car factor is defined as the number of pulses needed to cover one kilometer. If pulse transmitter is chosen as signal type the car factor (in pulses/km) has to be set.
Default: 4000; Range: 800 - 65535

Buzzer settings



Minimum Greensight volume
With this option the Greensight volume can be set depending on whether the Greensight is connected.
Range: 5 - 25%

Greensight volume
With this option the Greensight volume can be set.
Range: 15 - 100%

Beep signals volume
With this option the volume of the beep signals can be set, but not lower than the set minimum Greensight volume.
Range: 10 - 100%

Beep on camera switch
Set this option to 'Yes' if you want to hear a beep when the Greensight switches to another camera.

Beep on pressing key
Set this option to 'Yes' if you want to hear a beep when pressing a monitor key.

NOTE
The 'Minimum Greensight volume' and 'Greensight volume' only appear at the Buzzer settings window when the option 'Greensight connected' has been adjusted to 'Yes'.

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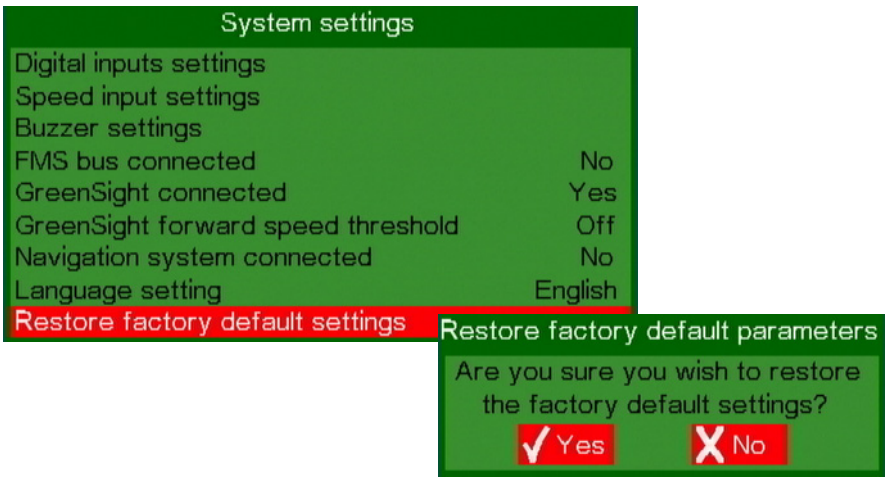
Other system settings



FMS bus connected
If FMS bus is connected set this option to 'Yes'. For information about FMS see the vehicle's manual.

Greensight connected
If a Greensight control unit is installed set this option to 'Yes'.

NOTE
This option can only be adjusted if 'Speed input settings' and 'Greensight connected' have been set to 'Yes'.

Greensight forward speed threshold
The monitor will switch off the Greensight information about the adjusted speed.
Range: 5 - 200 km/h

Navigation system connected
If a navigation system is installed set this option to 'Yes'.

Language setting
With language setting the preferred language can be set.

Restore factory default settings
When you select this option all your personal settings will be lost.

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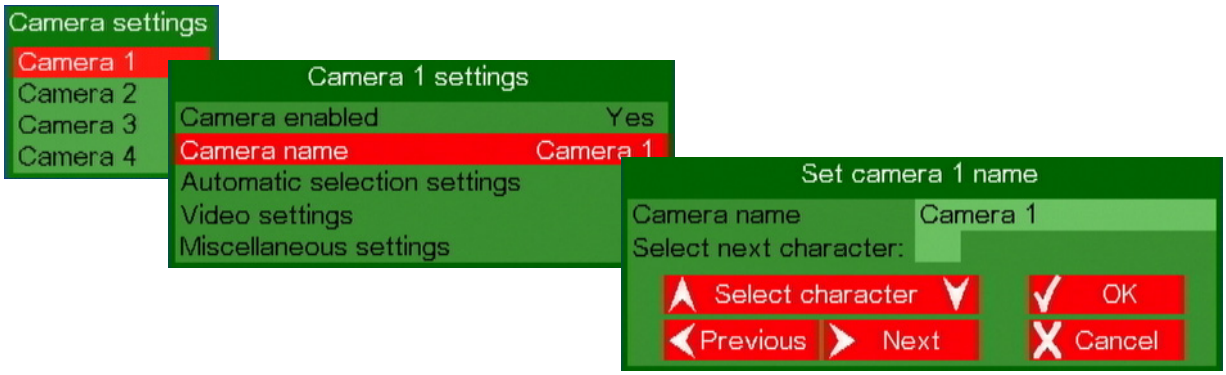
7.4.4 Camera settings

Camera 1 settings

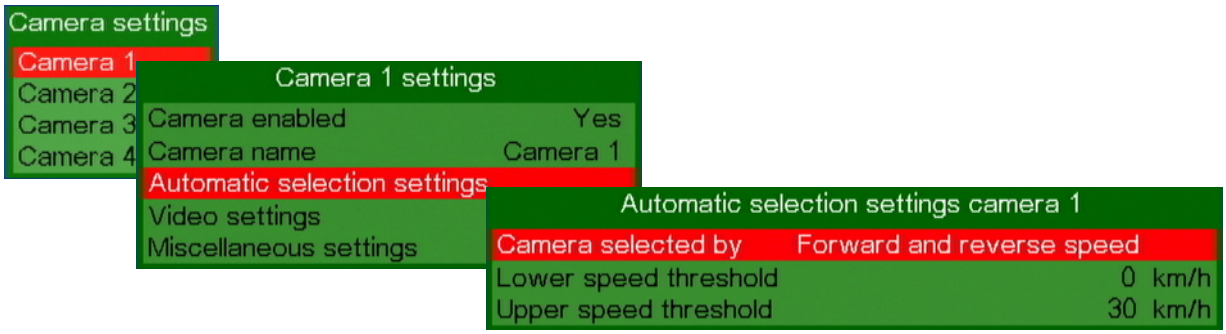
It is possible to change the camera name.



Explanation of button usage for entering a name:

- A character can be selected when pressing up/down with the multi purpose key.
- Pressing at the left side of the multi purpose key the previous character can be entered.
- Pressing at the right side of the multi purpose key the next character can be entered.
- Press ✓ to confirm and ✗ to cancel.

Automatic selection settings



The options for automatic camera selection are: always on, forward speed, forward and reverse speed, reverse, general input, general input and speed and manual control.

When selecting general input and speed, forward speed or forward and reverse speed the lower and upper speed threshold can be set.
Range lower speed threshold: 0 - 29 km/h
Range upper speed threshold: 1 - 200 km/h

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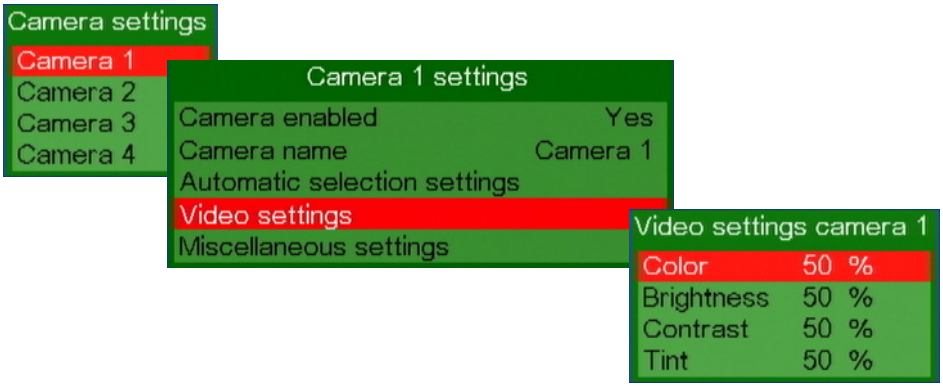
Video settings

Camera 1, 2, 3 and 4 needs to be set separate from each other. The camera you want to set, appears on the monitor.



Color
The degree in which the camera has to transmit colors.

Brightness
The degree in which the camera has to radiate or reflect light.

Contrast
The difference in visual properties that makes an object distinguishable from other objects and the background.

Tint
The tint is the degree of color strength.
Range of the video settings: 0 - 100%

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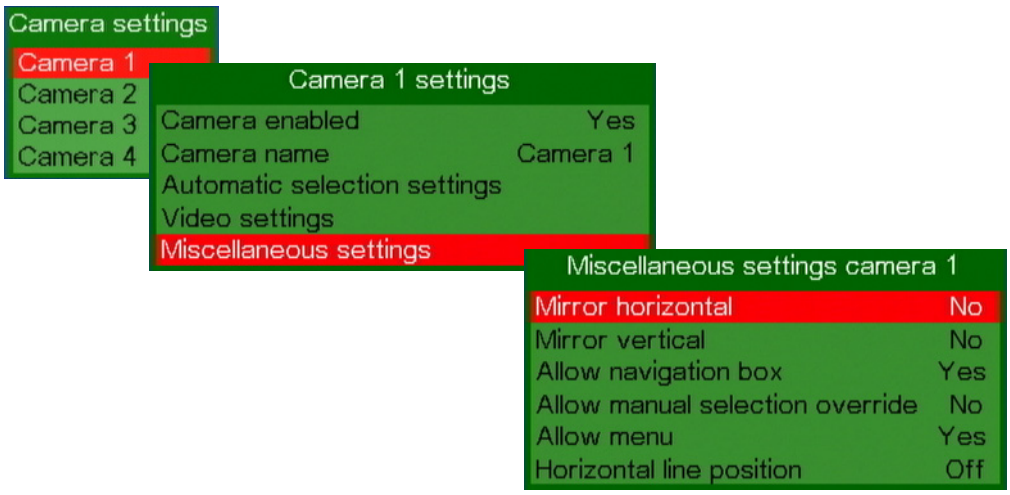
Miscellaneous settings



Mirror horizontal
Press 'Yes' when the camera view has to be horizontally mirrored.

Mirror vertical
Press 'Yes' when the camera view has to be vertically mirrored.

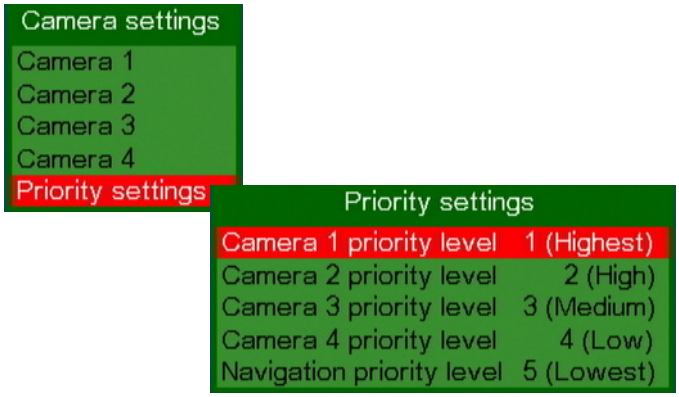
Allow navigation box
Press 'Yes' if the navigation arrows have to be visualized together with the active camera view (e.g. when the driver is turning left or right).

Allow manual selection override
Press 'Yes' when you want to override the current camera view with one of the F-keys.

Allow menu
Press 'Yes' when the driver has to be able to see the menu when the camera is active.

Horizontal line position
Only for the reverse camera a horizontal line can be set. When driving backward the horizontal line shown on the reverse camera can be helpful to manoeuvre the vehicle to a certain distance of a chosen object.

Priority settings



With priority settings the priority between the connected camera's and navigation can be set.
It is also possible to give camera's and navigation the same priority. When some camera's and/or navigation have been given the same priority the positions have to be determined. See Position settings.

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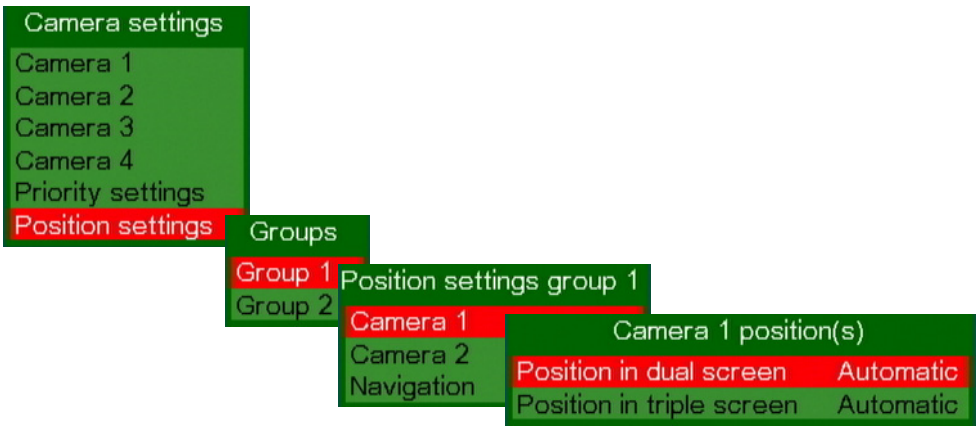
Position settings



It is possible that two groups appear at position settings. This is dependent on what priorities have been given to the camera's and/or navigation at priority settings. The components with the same priority level will appear in one group. In group 1 the components with the highest same priority level will appear. It is not necessary that the components you want to have in group 1 is set to '1 (Highest)'.

The position on a dual, triple or quad screen of a camera or navigation in a group can also be set.

Positions for a dual screen are: automatic, left or right.
Positions for a triple screen are: automatic, left, upper right or lower right.
Positions for a quad screen are: automatic, upper left, lower left, upper right or lower right.

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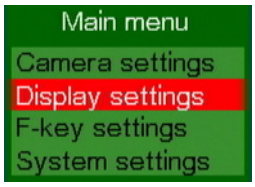
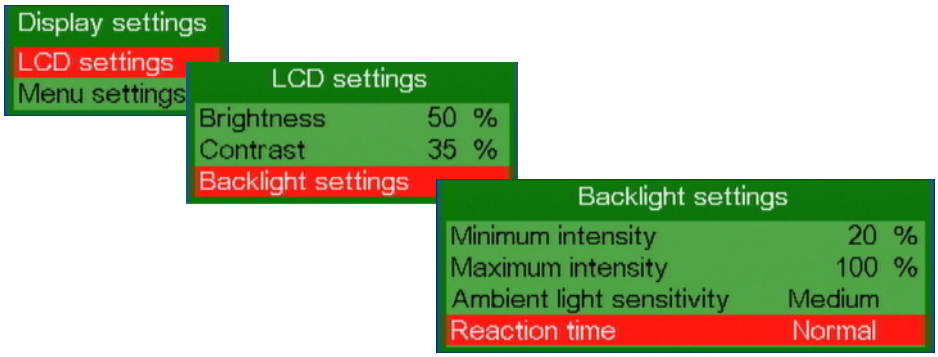
7.4.5 Display settings



LCD settings

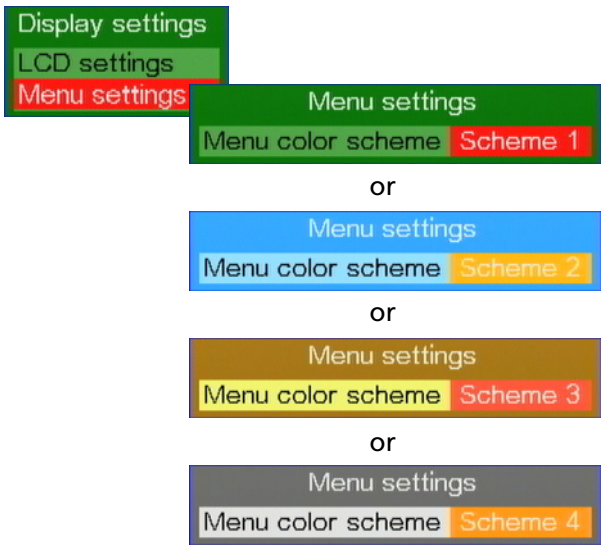
The LCD settings consist of brightness, contrast and backlight settings. The backlight settings are subdivided into minimum intensity, maximum intensity, ambient light sensitivity and reaction time.



The range of brightness is: 15-85%.
The range of contrast is: 5-95%.
The minimum intensity range is: 10-100%.
The maximum intensity range is: 20-100%.
The options for ambient light sensitivity are: lowest, low, medium, high and highest.
For the reaction time the options are: very slow, slow, normal, fast or very fast.

Menu settings

In menu settings four color schemes can be chosen.



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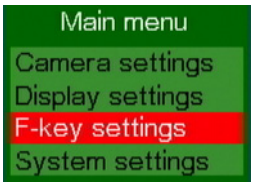
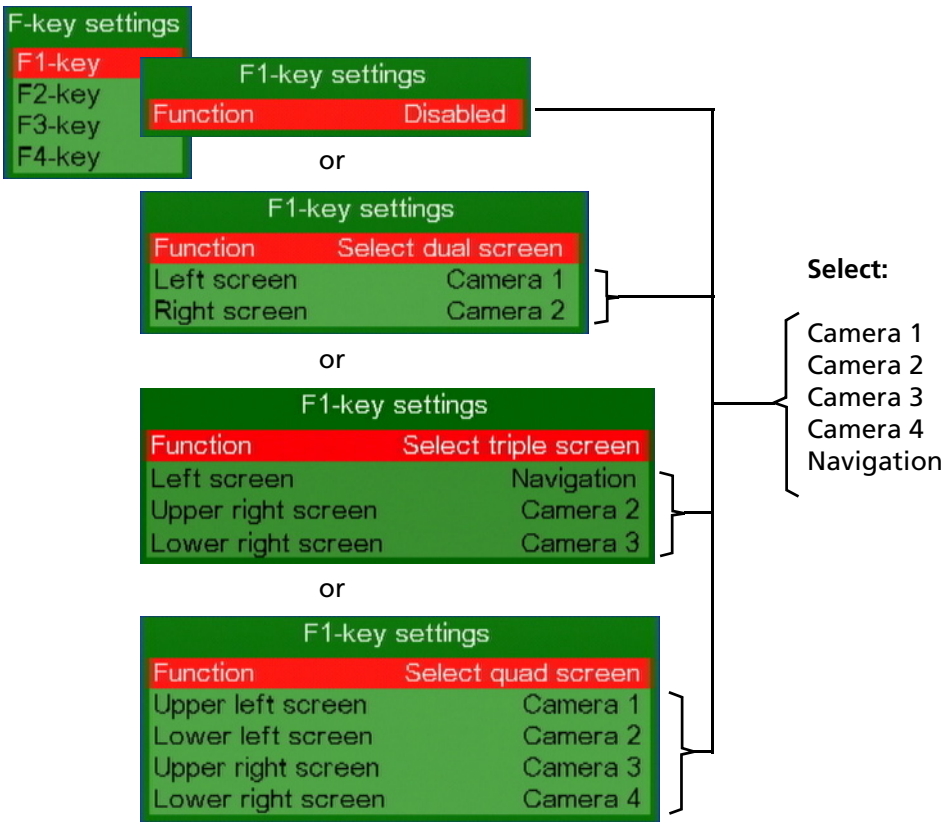
7.4.6 F-Key settings



The function of the buttons F1 to F4 can be adapted to your wishes. Supposing all camera's and navigation are connected the following options are possible: Disabled, Camera 1 to 4, Navigation, Dual, Triple or Quad screen.

If you prefer a Dual, Triple or Quad screen for a specific F-Key a selection can be made for each screen position. The options are: Camera 1 to 4 and Navigation.



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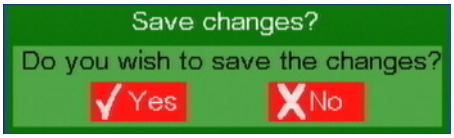
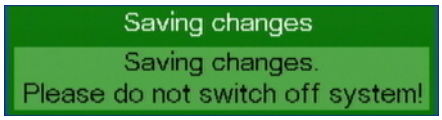
7.5 Save changes

After you have set the Groeneveld monitor to your wishes, the changes have to be saved. Press the cancel-key until the “Save changes?” screen appears.



Press the OK-key to save the change. The “Saving changes” screen will now appear for a while.



ATTENTION
The system must NOT be switched off while this message is shown. This to prevent data loss.

7.6 System Error

It is also possible that the disclaimer message will be followed by a system error when the parameters could not be loaded. In this case the factory settings will be used.

System Error
System error: Settings could not be loaded.
The factory default settings will be used.
Note that the system may not work as usual.
OK

7.7 Monitor error codes

The table below shows the meaning of the error codes that may appear on the monitor.

*Error code**	*Meaning*
FFF	Communication error detected.
F1 - F2 - F3	Left bottom sensor or sensor cable error detected.
F4 - F5 - F6	Right bottom sensor or sensor cable error detected.
F7	Left and right bottom sensor or sensor cable error detected.
E1	Left top/side sensor or sensor cable error detected.
E2	Right top/side sensor or sensor cable error detected.
HF	Hardware failure detected.
F10	Supply voltage error detected.
F11	Memory error detected.
F12	Temperature error detected.

* The error code is basically an indication. Other components than the ones indicated in this chart may be defective.

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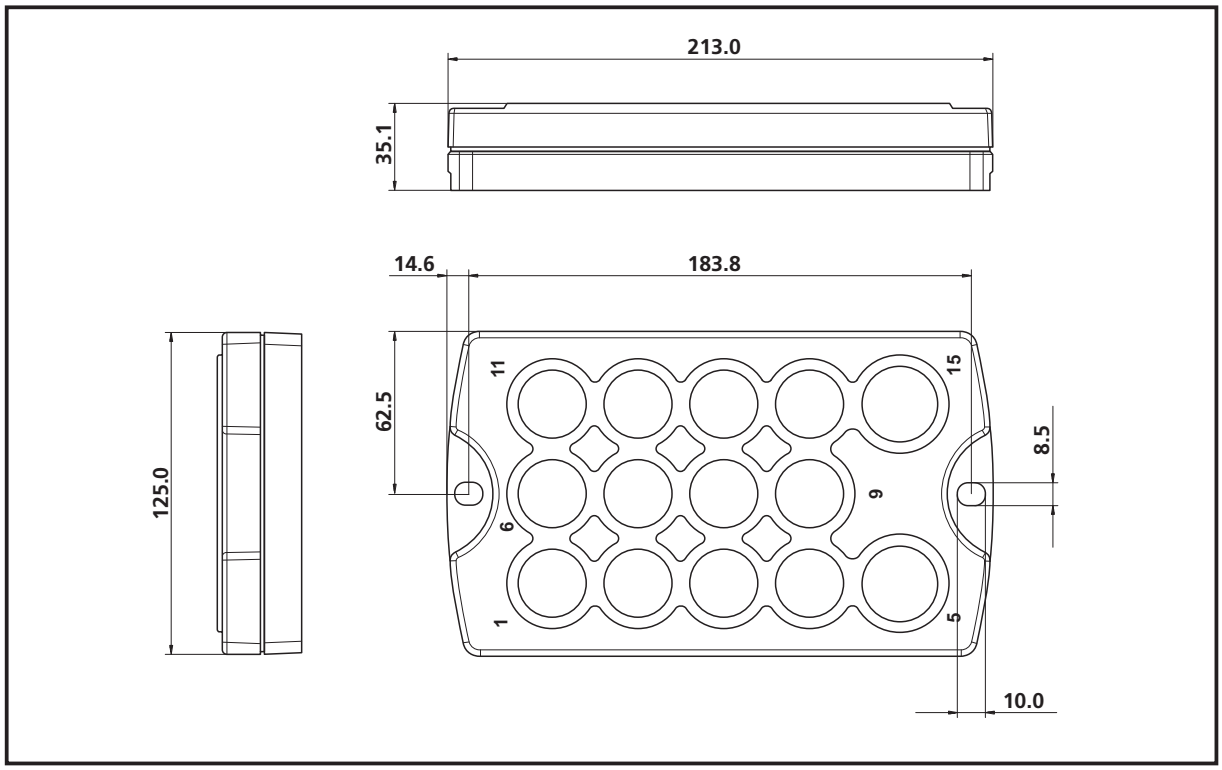
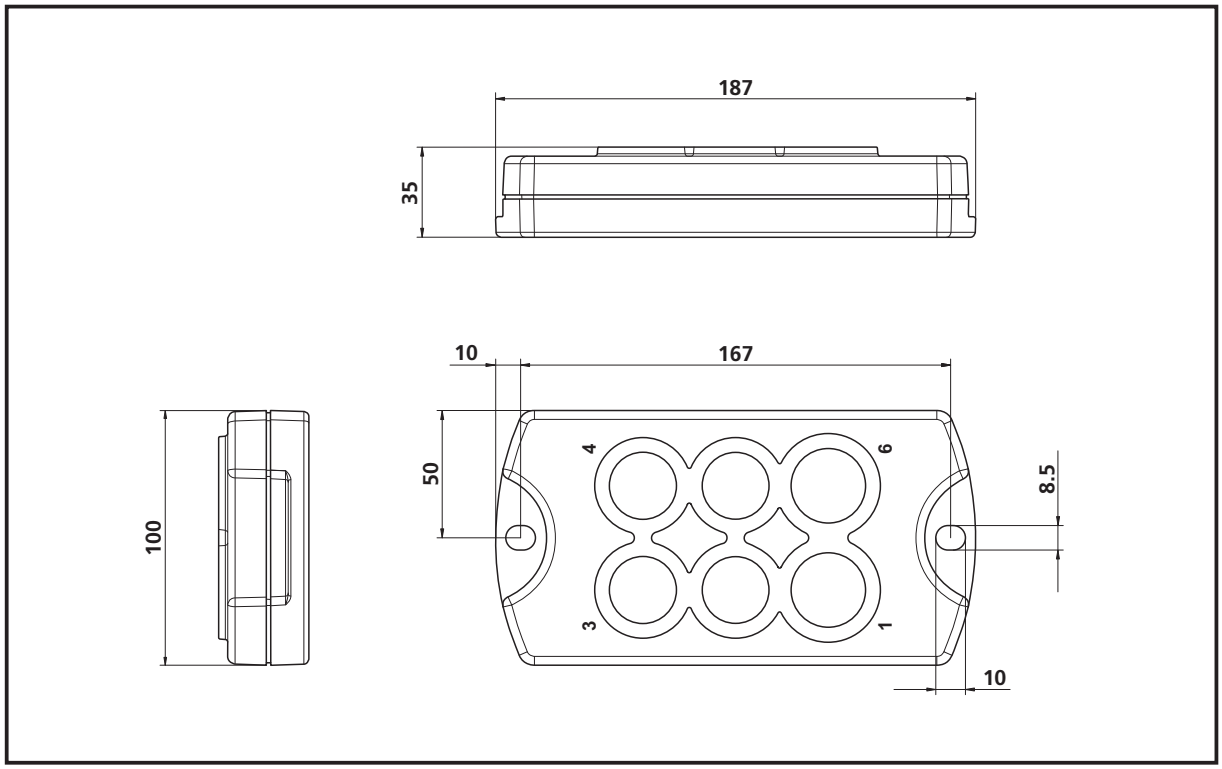
8. Dimensions

8.1 Control unit GS2



8.2 Control unit GS3



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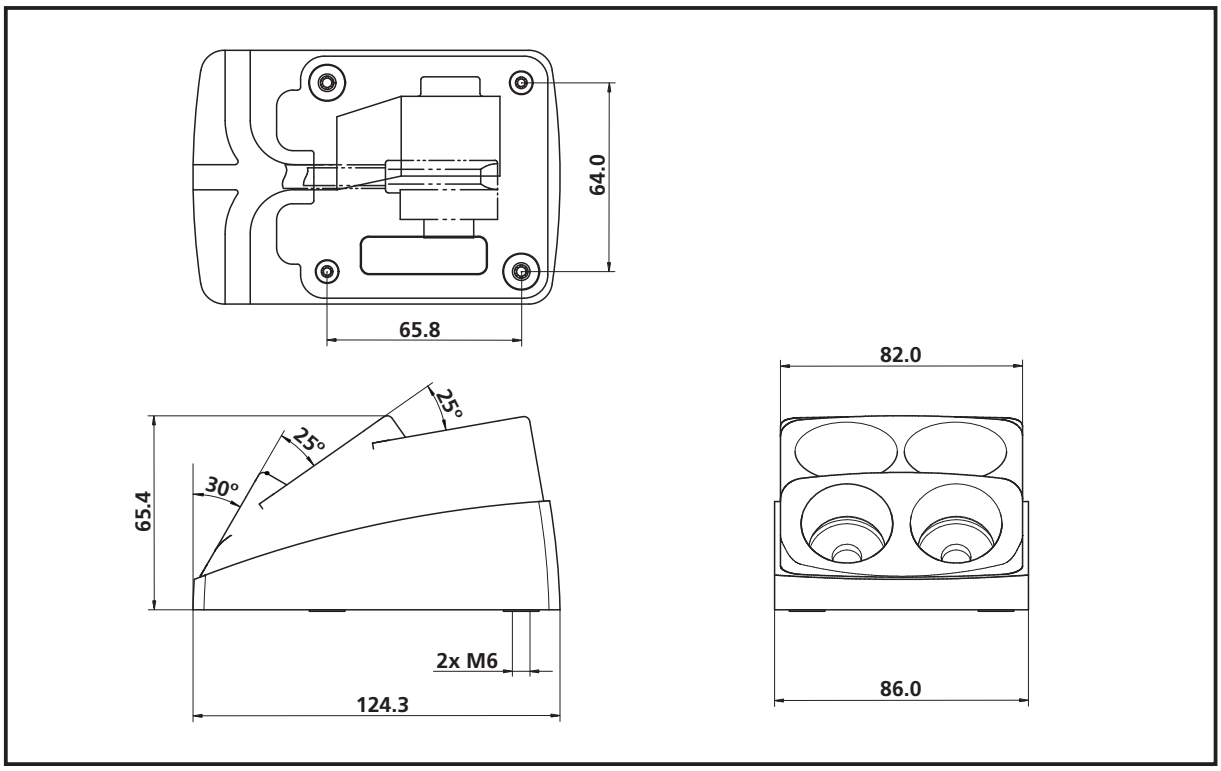
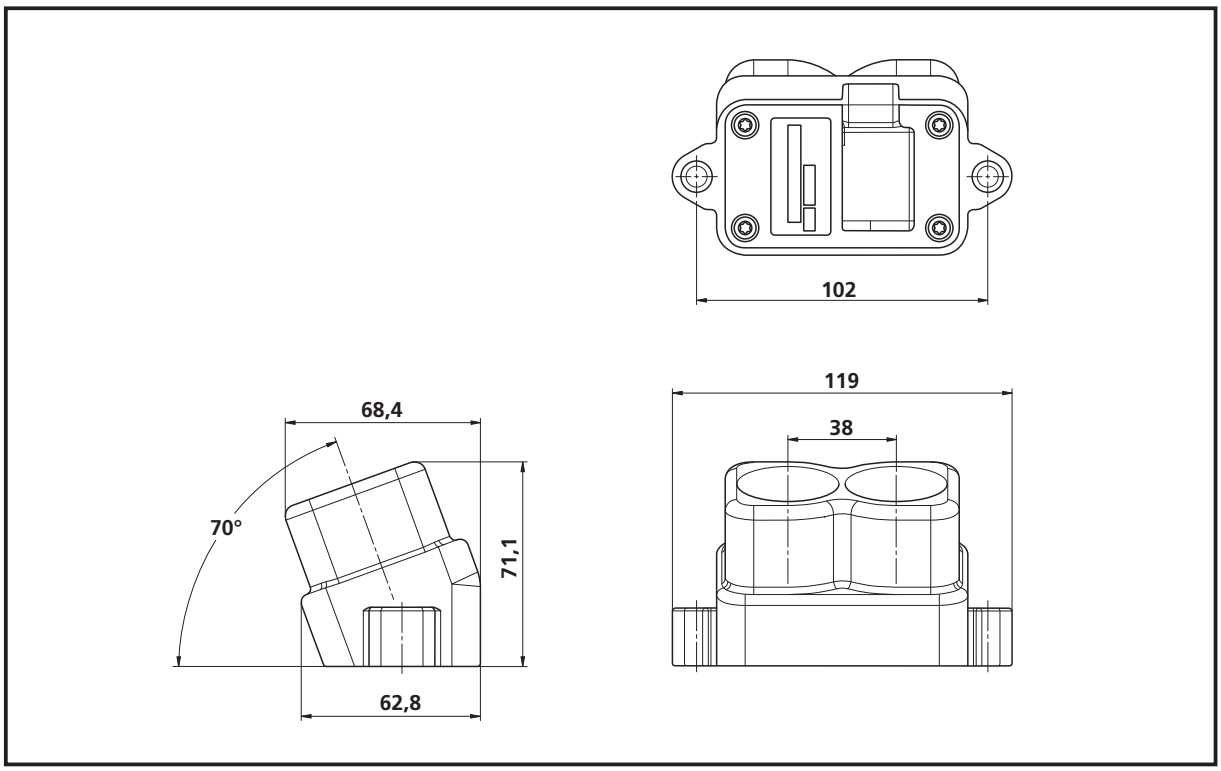
8.3 Bottom sensor



8.4 Top/side sensor



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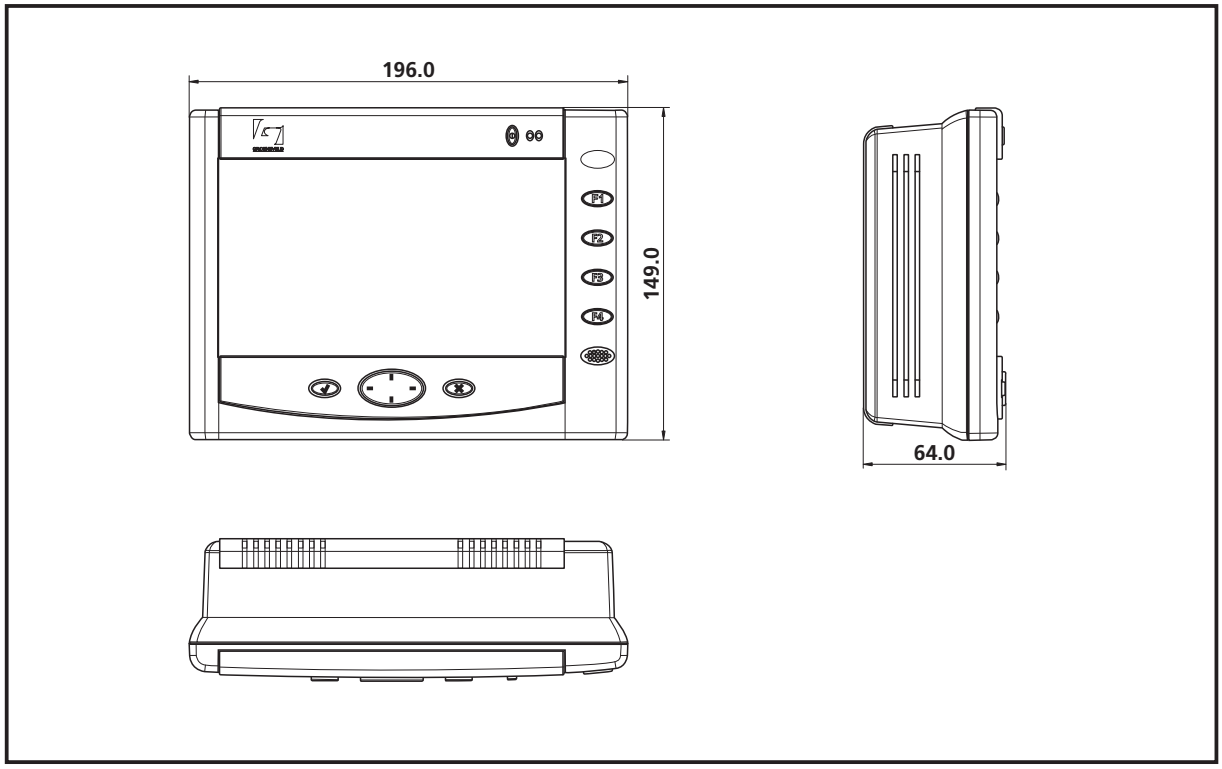
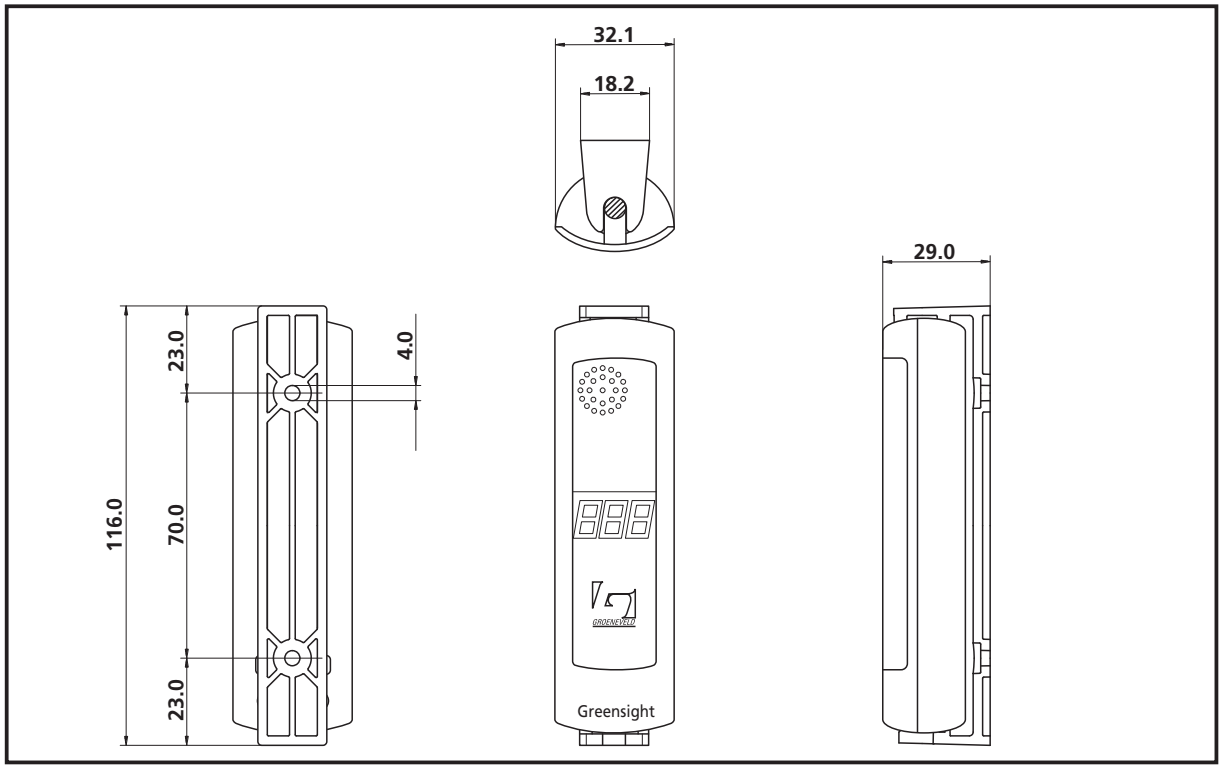
8.5 Monitor



8.6 In-cab display



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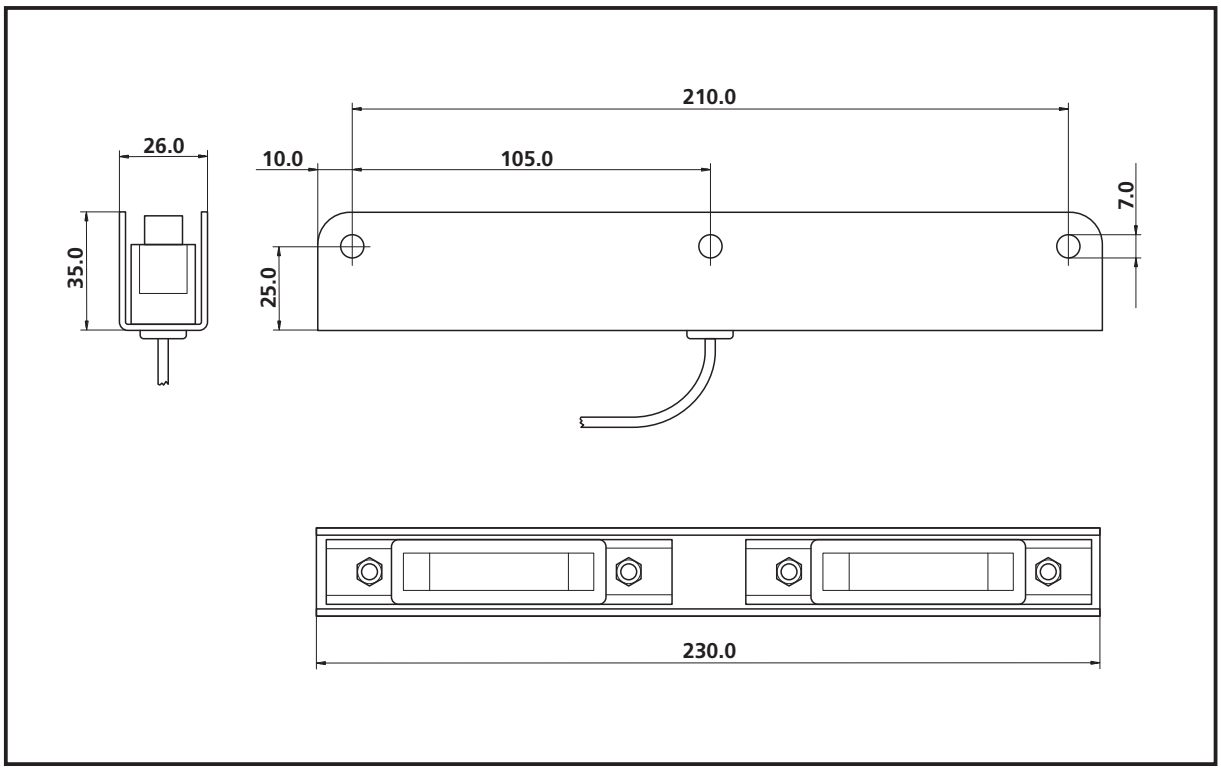
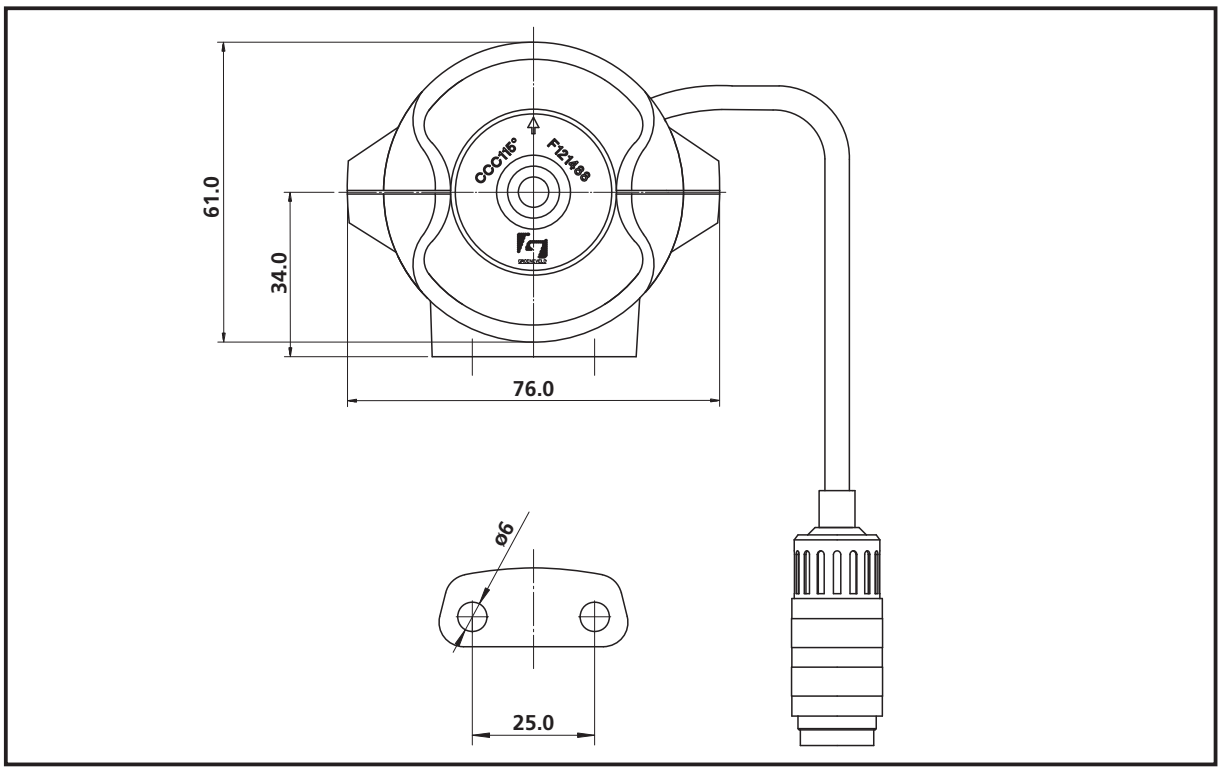
8.7 External lights



8.8 Camera



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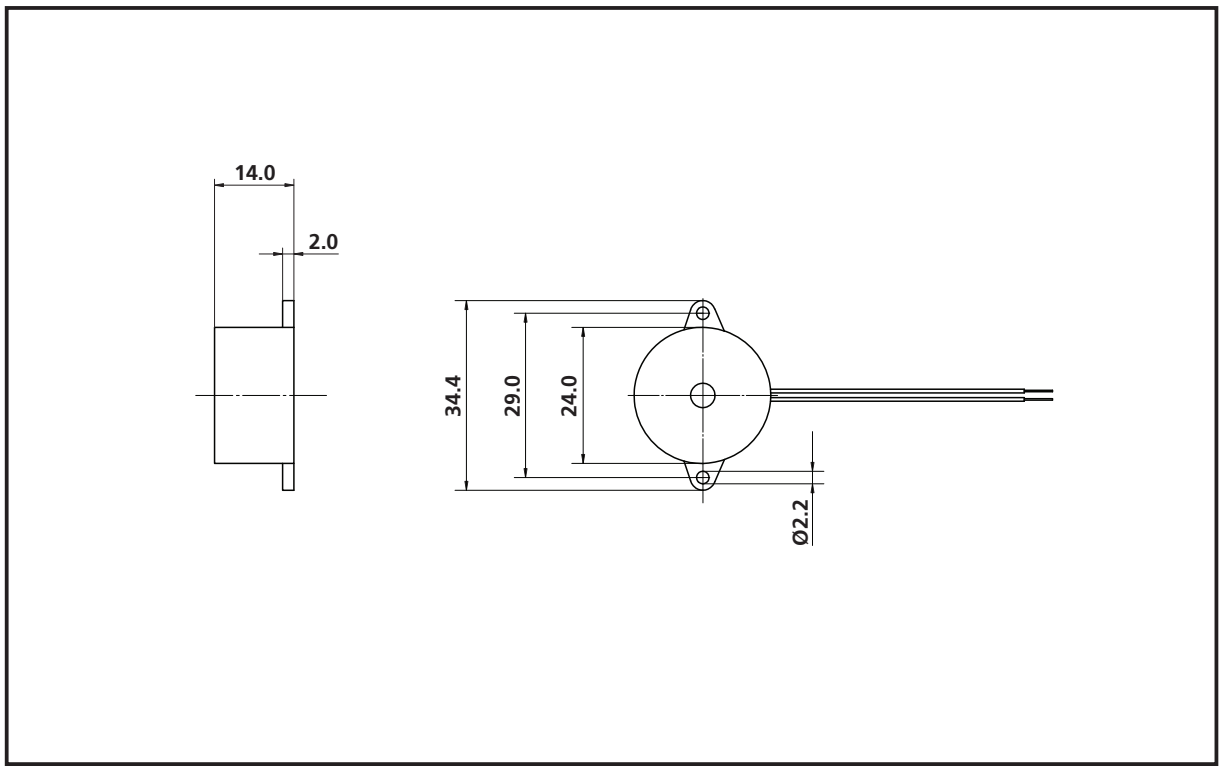
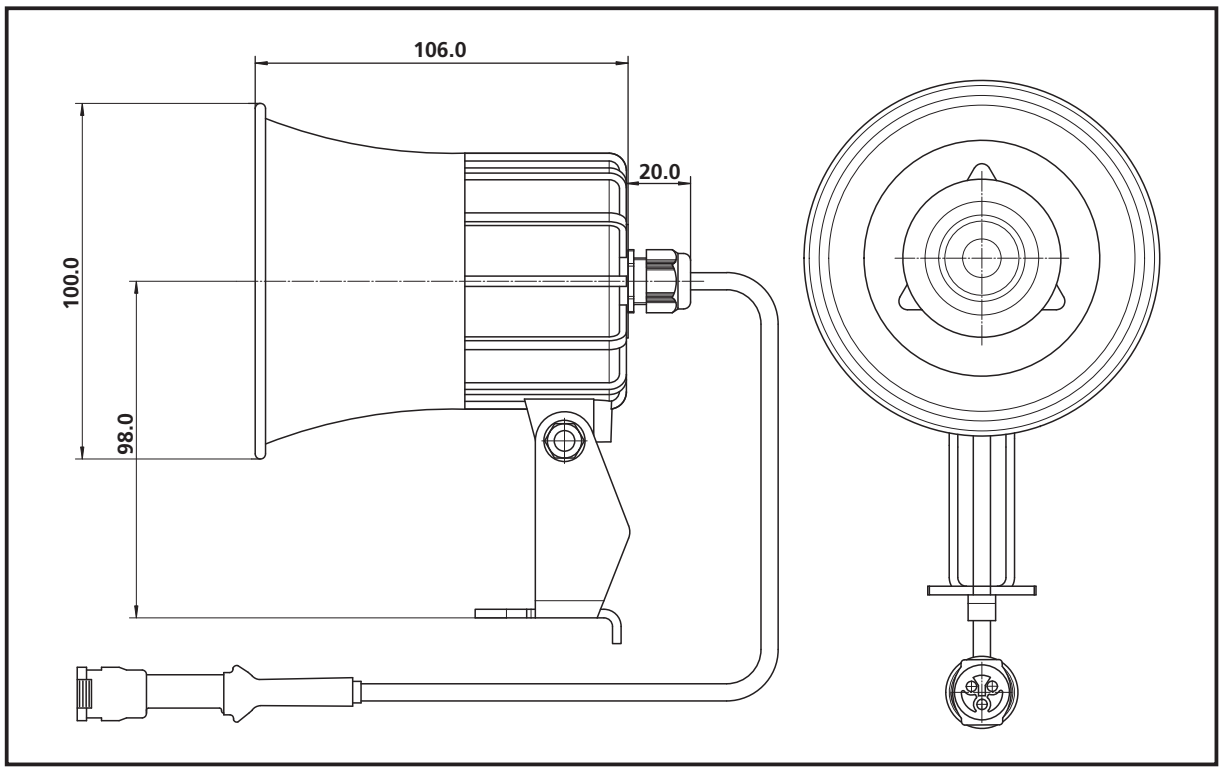
8.9 Buzzer



8.10 Alarm horn



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9. Technical specifications

Power supply voltage:	12 or 24 Vdc

9.1 Signalling zones (factory setting)

Signalling zones and detection area:	custom specification possible
Attention zone:	1,70 to 3,00 m
Danger zone:	0,70 to 1,70 m
Immediate collision danger:	0 to 0,70 m
Minimum dimensions of obstacle:	ø 75 mm

9.2 Weights

Control unit (GS2):	1600 grams
Control unit (GS3):	700 grams
Bottom sensor:	460 grams
Top/side sensor:	260 grams
Camera:	270 grams
Monitor:	1000 grams

9.3 Mirror directive and EMC

Greensight with camera and monitor complies with the following standards:

Mirror directive (transport):	2005/27/EC
EMC E-marking:	2004/104/E
EMC CE mark for earthmoving machinery:	ISO 13766
EMC CE mark for industrial lorries:	AND 12895*

* with exception of variant with monitor

Directives applicable to the Greencam monitor:

EMC directive:	2006/28/EC
EMC directive:	ECE R10
Mirror directive:	2005/27/EC
Mirror directive:	ECE R46

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Notes

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